High Level Bridge looking toward Terminal Tower in Cleveland, Ohio, where 1,300 miles of streets are being lighted correctly.

(See page 126 of this issue)

Solving the paving problem for cities of every size

PHILADELPHIA (Pop. 2,065,000)

PROVIDENCE, R. I. (Pop. 248,000)

AUSTIN, TEXAS (Pop. 132,000)

ATLANTIC CITY, N. J. (Pop. 61,600)

CLEARWATER, FLA. (Pop. 15,500)

PROSPECT PARK, N. J. (Pop. 5,250)

Call the roll of more than 1500 U. S. cities whose streets have been proved with various types of Texaco Asphalt construction. One interesting fact about these Texaco-paved cities is that they range from the country's largest (most American cities of over 25,000 population) down to small communities of a few thousand people.

Regardless of their size, these cities have found during the past 45 years that resilient, joint-free Texaco Asphalt paving absorbs traffic impact year after year with a minimum of maintenance. That means a low annual cost.

The variety of street improvement types which Texaco Asphalt products offer city officials make it possible to choose a type exactly suited to traffic and other requirements. Heavy-duty Asphaltic Concrete and Sheet Asphalt deliver lasting, economical service on a city's principal business thoroughfares.

Asphalt Penetration Macadam has been constructed under fairly heavy traffic in areas where stone is plentiful. Low-cost asphalt surfaces, employing liquid asphalt products and local aggregate, have been chosen for secondary streets. Inexpensive asphalt surface-treatments are applied where a dustless, waterproof mat is desired.

Helpful information on Asphalt construction for city streets is supplied in two illustrated Texaco booklets. Copies will be furnished by our nearest office without obligation.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO

REG. T.M.

TEXACO ASPHALT

Index to Contents of This Issue

AIRPORTS AND AVIATION
Hinged Wind-Cone Standard Aids Servicing 23
Plywood Flags Last Indefinitely on Airport Vehicles 23
Wooden Tripods Protect Runway Lights 23

BILLBOARD CONTROL
Cities Regulate Downtown Signs..... 129

BOND MARKET
Representative Municipal Bond Sales, September 4-12, 1951..... 135

BRIDGES
Steam Cleans a Steel Bridge 92

CIVIL DEFENSE
From the Medical Staff of the Federal Civil Defense Administration..... 7
Water Works Countermeasures..... 104
Communications — Nerve Center of Civil Defense 105

CONFERENCES AND CONVENTIONS
City Managers Hold Largest Meeting.... 124
Conventions—When and Where..... 137

COUNCIL-MANAGER PLAN
City Managers Hold Largest Meeting.... 124
Recent City Manager Appointments..... 135

DISASTER PLANS AND RELIEF
Lessons from Disaster for City Government 83

EDUCATION AND TRAINING
University Planning Research Post Open 103
Future Springfield, Inc., Gives Traffic Scholarship 108
Industry's Concern with Community Improvement and Higher Education..... 108
New Course on Government Publicity and Information 123
Racine Library Answers TV Challenge.. 135

EQUIPMENT
Mechanized Municipal Services 98

FINANCE AND TAXATION
Toledo Assesses Special Street Cleaning Tax 89
Uniform Graded Tax for Alberta Municipalities 116
Cigarette Tax in Colorado..... 131
Old Records — New Revenue Source for Philadelphia 131

GOVERNMENT AND ADMINISTRATION
Municipal Clerks' Organization Moves to Chicago's "1313"..... 5
New Officers and Trustees of G.R.A. ... 9

HOUSING
New Federal Director of Housing Research 9
Prefabricated Dwellings for Public Housing 92
Federal Aids Are Available for Critical Defense Housing Areas..... 114

INDUSTRY AND THE COMMUNITY
Industry's Concern with Community Improvement and Higher Education..... 108
Defense Industry for Your Town..... 110
Industrial Development Company Gets New Industry for Slater, Mo. 131

LAWS AND LEGAL DECISIONS
Zoning and Planning Notes 130
Legal Notes and Decisions..... 133

LIBRARIES
Racine Library Answers TV Challenge... 135

LIGHTING, OUTDOOR
Cleveland Lights Every Street Correctly.. 126
"The Most Effectively Lighted City of Its Size" 147
Why Not Have Modern Street Lighting in Your City? (Part III) 149
Where Gas Lights Still Glow..... 151

PARKS AND RECREATION
Lansing Owens 12½ Miles of River Banks 115
Memorial Band Shell a Major Civic Asset 128

VOL. LXVI
No. 10

OCTOBER
1951

The American City

Issued Monthly by the
American City Magazine Corporation
470 Fourth Ave., New York 16, N. Y.
Tel. MU-5-9252

HAROLD S. BUTTENHEIM, Editor
ALDEN W. WELCH, Secretary, Research Editor
WILLIAM S. FOSTER, Engineering Editor
CARL ERIC CARLSON, Associate Editor
CAROL W. HIGHTOWER, Production Editor

EDGAR J. BUTTENHEIM, President
GEORGE S. CONOVER, Vice-President
EDWIN WAGNER, Treasurer
DONALD V. BUTTENHEIM, General Manager
MYRON MacLEOD, Advertising Manager
Lt. EDWARD C. ALLEN, Jr., Promotion Mgr.
(On leave of absence for military duty)
Lt. EDGAR M. BUTTENHEIM, Asst. Adv. Mgr.
(On leave of absence for military duty)
EDNA A. JONES, Production Manager

BRANCH OFFICES
Daily News Building, Chicago 6
George S. Conover, Warner H. Robinson

420 Leader Building, Cleveland 14
Robert C. Burton

2236 Ben Lomond Drive, Los Angeles 27
1010 Equitable Bldg., Portland, Ore.
Albert T. Miller, *Pacific Coast Manager*

Subscription $4 per annum to any part of the world. Single Copies, 50c. Back Copies, $1.00. Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879. Printed in the U. S. A.

The American City is indexed regularly by Engineering Index, Inc., and the Reader's Guide to Periodical Literature

THE MUNICIPAL INDEX and ATLAS (over 800 pages), published annually by the American City Magazine Corporation, when used with the current advertisements in THE AMERICAN CITY, provides officials with the latest information on all types of municipal equipment and supplies.

PLANNING AND ZONING
New Problems for the Professional Planner 5
How Big Should a City Be?..... 7
West Palm Beach Plans Huge Expansion Program 96
University Planning Research Posts Open 103
Pennsylvania Defense-Boom Area Tackles Critical Problems 125
Zoning and Planning Notes..... 130
Princeton Sponsors Urban Planning Forum 155

POWER
Diesel Saves $70,000 a Year..... 100
How Los Angeles Washes Insulators..... 101

PUBLIC BUILDINGS
New House for Public Safety in Corpus Christi 17
South San Francisco Gets New Police Headquarters 121
Spring Valley, N. Y., Gets Low-Cost Village Hall 121
Memorial Band Shell a Major Civic Asset 128
New Town Hall for Oslo, Norway..... 128

PUBLIC HEALTH
City Officials and Military Fight VD.... 94
Need for Blood Creates Immediate Emergency 127

PUBLIC RELATIONS
The City Tells Its Story..... 122
New Course in Government Publicity and Information 123

PUBLIC SAFETY
Making Officers Visible at Night..... 17
New House for Public Safety in Corpus Christi 17
The Fire Fighters of the Red River Valley 17
Crime Must Be Attacked at the Local Level 129
Let Us Invest Law Enforcement with Romance! 129

PUBLIC WORKS
New Officers and Awards, American Public Works Association..... 111

PUBLICATIONS
Manufacturers' Catalogs 25
Municipal and Civic Publications..... 153

PURCHASING
Don't Keep Invitations to Bid Too Local. 5
Quality Purchasing for a Small Municipality 120
Municipal Purchasing News 161

QUIZ
THE AMERICAN CITY Quiz 5

REFUSE COLLECTION AND DISPOSAL
Public Works Men See New Use for Fogger 19
Sanitary Landfill Demonstrations Held in New Jersey 19
Quaker State Cities See Sanitary-Fill Operation 93
Incinerator Design Principles Put Into Practice 112

SEWERAGE AND SEWAGE TREATMENT
Operating Results from Daytona Beach Plant 15
Pneumatic Ejectors for Sewage Pumping 15
Persistence Pays in Sewage Purification.. 90
Stockton, Kans., Builds Water and Sewer Lines 99
Tampa Makes Sewage Treatment Financially Sound 106

SMOKE ABATEMENT
Cleaner Air Week 119

STREET CLEANING AND SNOW REMOVAL
A Many-Purpose Grader 13
No Sand-Bar Trouble 13
Super Street Cleaning in North Topeka 13
Where Snow Removal Is Toughest..... 88
Toledo Assesses Special Street Cleaning Tax 89
Less Work — Moves More Snow..... 102

STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE
How to Get a Good Seal Coat..... 21
Some Pertinent Facts About Asphalt.... 21
A Seal-Coat Street Saver..... 109
Some Elements of Street Construction and Maintenance, Part II..... 116

TRAFFIC CONTROL AND FACILITATION
Future Springfield, Inc., Gives Traffic Scholarship 108
Detroit's Street Names Always Bright.. 141
84-Car Metered Lot Opened in Pomona, Calif. 143
Trafficones Easy for Workers and Traffic. 145
Transit Vehicles Essential to Reduce City Traffic Congestion 145

VOTING MACHINES
Why Denver Likes Voting Machines.... 9

WATER SUPPLY AND TREATMENT
Are Sulphur-Type Joints Any Good?... 11
How to Dispose of Water-Softening Sludge 11
A Wide-Scale Expansion of the Water System 86
West Palm Beach Plans Huge Expansion Program 96
Stockton, Kans., Builds Water and Sewer Lines 99
Water Works Countermeasures 104
Columbus Water Intake Line Built by Tunneling 119
What Michigan Cities Have Learned About Fluoridation 123

Index to Advertisers, p. 206 • Coming Conventions, p. 137 • Copies of this issue printed, 22,500

Above the Flooded River. Poised a few feet above the swirling flood, a telephone repairman tests a cable on a bridge between Kansas City, Kansas, and Kansas City, Missouri, while his companion uses a walkie-talkie to co-ordinate repair work. In other places, telephone men were forced to take to boats.

Meeting the Emergency. Telephone people not only worked valiantly to restore service but to keep it going. Dikes were thrown around telephone offices. Switchboards raised above rising waters. Emergency power plants set up. Mobile radio telephones rushed to towns where telephone offices were washed out.

FIGHTING THE NATION'S COSTLIEST FLOOD

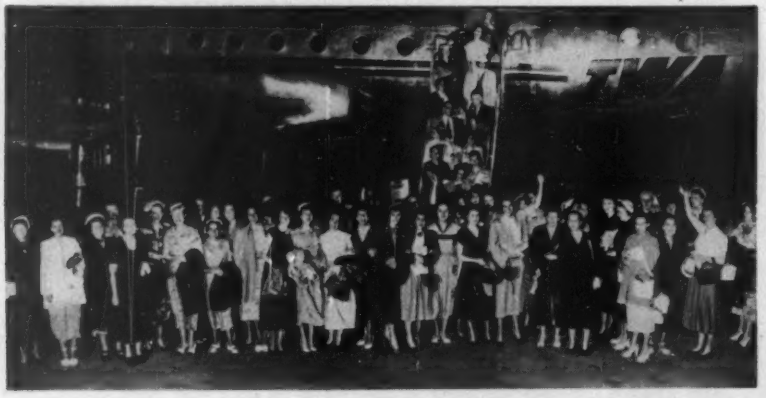
From the flooded sections of Missouri, Kansas and Oklahoma have come stories of the loyalty, skill and courage of telephone people in one of the Nation's worst floods.

Many returned from vacations to help. In one town, a single radio appeal for former operators brought twice as many as were needed. Hundreds of trained telephone people from other states were rushed to the scene to help their fellow workers.

Once again the Western Electric Company — the Bell System's manufacturing and supply unit — proved its value in an emergency. By plane, fast freight and truck it rushed millions of feet of cable and wire, telephones, switchboards and other needed equipment.

No one can tell when or where such emergencies will occur, but the Bell System has to be ready and able to handle them when they happen. That means financially able as well as physically able.

This points up again that it takes a financially strong telephone company, with a strong supply organization like Western Electric, to give the Nation the service it requires.



Flying to the Flood Front. Part of one hundred Long Distance operators who were flown from NewYork, Louisville and Chicago to Kansas City, Missouri, where a flood of calls followed the flood of waters. With traditional Bell System speed and teamwork, they pitched in to help at busy switchboards in the stricken areas.

• BELL TELEPHONE SYSTEM

Our Municipal Notebook

Don't Keep Invitations To Bid Too Local

A CITY of 150,000 wanted to buy some traffic signals. Having no more information than that, THE AMERICAN CITY asked how many signals would be purchased and if any official notice had been issued.

The City Purchasing Agent replied that 27 traffic signals and 44 controllers would be purchased and that "the only official notice will be a notice in local newspapers on September 13 and 14, on which dates specifications and bid forms will be ready and for which a deposit of $10 cash or certified check is required. Bids are due 2 p.m., September 24, 1951."

One of the traffic-signal manufacturers to whom this information was relayed by THE AMERICAN CITY remarked that it would be very much to the advantage of such a city to see that this information reached all the manufacturers of traffic signals. That certainly would seem the way to obtain widest competition. It can be done most inexpensively by merely notifying THE AMERICAN CITY, which will see that the information is sent air mail or telephoned to the leading manufacturers.

New Problems for the Professional Planner

DISCUSSING "The Planning Process in Urban Development and Redevelopment," at a sectional meeting of the American Bar Association, on September 18, Ira S. Robbins, Executive Vice-President of the Citizens' Housing and Planning Council of New York, pointed out that:

In addition to the traditional fields of activities, the professional planner finds that urban development and redevelopment brings him face to face with new problems, social and economic, which he alone cannot solve but which he cannot ignore. These include the problem of relocating families who are displaced by the operations in a project area; the problem of the small shopkeeper and small businessman who are displaced; the problem of finding new quarters for displaced minority groups who so frequently live in redevelopment areas; the problem of preventing urban redevelopment from being perverted into a device for racial or social discrimination by the establishment of areas in which families of one income level or of one race are concentrated. Last, but not least, are the public relations and public participation aspects in the formulation of urban development and redevelopment programs. Many people don't realize what a stake churches and political groups, as well as resident and property owners, have in any plans for the future of their areas.

Municipal Clerks' Organization Moves to Chicago's "1313"

By GEORGE B. WELLMAN
Town Clerk
Watertown, Mass.

OFFICIALLY born in May 1947, at French Lick Springs, Ind., the National Institute of Municipal Clerks today represents the fastest growing municipal organization in the country.

Its growth and importance as an organization was marked on October 1, with the opening of an office at 1313 East 60th Street, Chicago, headquarters of 16 national municipal organizations. Potentially, the Institute can become one of the largest of the municipal organizations, and under the leadership of its President, Arthur J. Shinners, Town Clerk of Brookline, Mass., bids fair to accomplish a goal of 1,000 members before 1952.

The first meeting at French Lick Springs was attended by 40 clerks, and the most recent annual conference, held in May of this year in Boston, was attended by 244 clerks, recorders, secretaries, clerks of council, and city registrars. In September, the Institute's membership was 602.

The first president was John J. Coffey, City Clerk of Buffalo, N. Y., but shortly after his election he assumed a new position and resigned. Philip P. Costello, City Clerk of Perth Amboy, N. J., served for a period as secretary during the interim until the second meeting held at Atlantic City in 1948.

At this meeting, Arthur J. Shinners took over the presidency, and has been re-elected unanimously at each of the succeeding meetings, held in Chicago, Cincinnati, and Boston. President Shinners has been instrumental in furthering the interest of the organization and, under his direction, it has assumed strength and prominence.

The organization publishes a monthly newsletter, has published in booklet form the proceedings of the conferences, and has furnished answers to many clerks on questions concerning their duties. At the Chicago office the organization will have a permanent headquarters, its own personnel, and extensive research library facilities. The Institute is dedicated to the "science of recording and preserving public records and documents and to the furnishing and dissemination of information in order to safeguard the interests, rights, and privileges of municipalities." It has well been said that the clerk's office is the "hub of government," and these objectives are of special importance today.

The 1952 conference has been scheduled for Dallas, Texas, during the month of May. City Secretary Harold G. Shank has been named conference chairman, and it is his aim to make all Texas clerks members of the conference committee.

The officers of the Institute, in addition to President Shinners, include five vice-presidents. These are: Mrs. Irma F. Bitner, City Recorder, Salt Lake City, Utah; Joseph L. Richardson, City Clerk, Atlanta, Ga.; Stanley J. Witkowski, City Clerk, Milwaukee, Wis; Mrs. Maria K. Filarski, City Clerk, Kalamazoo, Mich., and Edward J. Rock, Village Clerk, Floral Park, N. Y. Mrs. Gladys E. Menzer of Oneida, N. Y., is Chairman of the Advisory Committee.

The American City Quiz

Match Wits with the Experts

QUESTIONS

1. ***What is the average cost of ratproofing a building?***
2. ***What is the cost of an aerial survey?***
3. ***Should all water accounts be billed at the same time?***
4. ***Are tin cans from incinerator residue of any value?***
5. ***How successful has been the use of snow-loading equipment in picking up leaves?***
6. ***Are there any portable automatic traffic signals that can be used for temporary locations?***
7. ***How can one illuminate a street without adding to the already numerous poles on the street?***
8. ***How many people work for municipal governments?***
9. ***What danger is there of polio tranmission in swimming pools?***
10. ***What is the cost of stream pollution in terms of water purification?***

(Answers on page 9)

ONE OF SEVEN

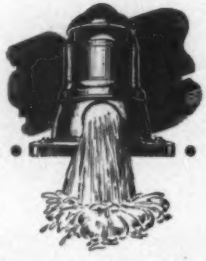
Big Producers

AT KEY WEST, FLORIDA

Seven Layne Well Water Supply units, each testing around 8,000 gallons per minute, have been installed to furnish cooling water for a power project at Key West, Florida. Permanent installations will be Layne Vertical Turbine type Pumps, each having a capacity of 2,300 gallons per minute. Preliminary tests indicate that efficiency will be much higher than promised.

Layne's method of designing, building and installing well water supply units is fully proven in higher production and lower operation cost. All installations are by Layne's own field crews and the work, from start to finish, is under the constant supervision of Layne engineers. Thoroughly tested before final delivery, Layne wells and pumps provide the utmost in dependability and long life. For further information, catalogs, bulletins, etc., address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.



WELL WATER SYSTEMS

• For Cities,
• Factories
and Plants of all Kinds

Layne contracts for and builds complete well water supply systems of any size or capacity and for any need such as cities, factories, ice plants, packing houses, paper mills, railroads, pipe lines, petroleum refineries, chemical plants, air fields, irrigation farming and many other places where big quantities of well water must be obtained at low cost.

Layne
WATER SUPPLY
WELLS & PUMPS

From the Medical Staff of the Federal Civil Defense Administration

To the Editor of THE AMERICAN CITY:

The medical staff of the Federal Civil Defense Administration has examined closely your article on "Emergency Medical Care If Disaster Strikes," published in the July issue of THE AMERICAN CITY.

While we agree generally with the procedures described, I have been asked to clarify the Federal Civil Defense Administration's position on some of the following points raised in this article.

1. The concept of providing radiological monitors for all medical stations around the periphery of a disaster area is not ours. We do not agree they are necessary. Also, area radiological monitoring teams will not have the responsibility for such specialized monitoring functions as determining the nature and extent of the contamination of all suspected food supplies, water supplies, and equipment.

2. While the article states that "each first-aid station is completely mobile," we should like to point out that we have no objections to setting up *fixed* first-aid stations provided a complete mobile system also can be maintained.

3. The statement that physicians are assigned to work in the vicinity of their residence should they be trapped and not able to reach their primary assignment is not strictly true. It is assumed that a doctor will work where he is if he cannot move. It is true that physicians in the city will have a great variety of primary and alternate assignments: work in surviving existing hospitals, work in improvised hospitals, assignment to first-aid stations, assignment to one of several duties in connection with evacuation, etc.

4. While we recognize the article's endeavor to be realistic in describing a post-disaster situation, we cannot subscribe to the philosophy of the statement, "Only those with a chance for recovery are treated; others are laid aside and made as comfortable as possible." Our aim will be to do everything within our power to save as many lives as possible, not to decide which lives are worth trying to save and which are not.

5. The tagging of casualties, with a note of their location at the time of the blast may *suggest* a potential radiation casualty; the article implies that radiation casualties can be definitely identified because of their location.

6. The article states that "As soon as possible after the disaster, tuberculosis patients, long-term cases, and all but critically ill will be evacuated to other communities." Cases such as these might be sent to homes or other buildings in the *same* community, not necessarily to *other* communities.

7. The article's point regarding the congregating of types of wounds should be made more clear, even though you indicate indirectly that this cannot be done until four or five days after a major disaster. Obviously, the principle of congregating types of injuries in an emergency situation after a disaster would create an impossible problem in first-aid stations and in ambulance distribution of patients. We have recommended that some classification of wounds with relationship to areas in hospitals be used.

8. Certainly the chances of recovery are improved by proper treatment for 30 or 45 days, but if a patient has received a "lethal dose" (600r or more) of radiation, he will probably die in spite of any treatment. Proper treatment may prolong his life a while, but a lethal dose will result in death.

9. With regard to blood plasma and plasma substitutes, periston is mentioned in the article. This has not yet been accepted by the National Research Council, which is investigating plasma substitutes for the Federal Civil Defense Administration. "Dextrin" should be spelled "dextran."

10. On blood grouping after a disaster from the communities-support blood-donation plan, the difficulty here is not a question of "relegating" facilities and personnel "to the tedious chore" of grouping, etc. The difficulty is that we do not have enough technicians nor laboratory facilities to enable group specific blood transfusions to be carried out in such volume in the short time required.

T. P. HEADEN
Director, Publications Division
Public Affairs Office
Federal Civil Defense Administration

Editor's Note: THE AMERICAN CITY's article, "Emergency Medical Care," was based on information from a variety of local, state, and federal sources. Reprints of it have been made by the Council on National Emergency Medical Service of the American Medical Association, for distribution to state chapters. To clarify some of the factors of emergency medical care on which expert opinions and judgments differ, a National Civil Defense Medical Conference is being held on November 9 and 10 in Chicago, co-sponsored by the American Medical Association, the American Hospital Association, and the Association of State and Territorial Health Officers. The Federal Civil Defense Administration is also actively assisting in preparing the program. One of the primary purposes of the meeting is to bring together the state health officer, the top state hospital administrator, and the most active member, in terms of civil defense, from each state medical association.

How Big Should a City Be?

To The Editor of
THE AMERICAN CITY:

"What is the best size for a city?" as posed in James Dahir's critique in the August issue of THE AMERICAN CITY brings to light some considerations about city size which are timely to examine.

In many parts of the world today, there are sizeable capital investments going into the development of new towns, there is considerable planning, and there are some positive steps being taken toward limiting, even reducing, the size of cities. Much of this effort is based on conceptual notions of city-size which have never been fully investigated.

Some of these schemes are expressed in extremely imaginative designs and exciting systems of urban forms, and—within the designer's purview—possess the logic and most of the requirements of sound planning. A population of from 30,000 to 50,000 is frequently selected as the range within which is offered the most happy combination of all the qualities of urban living sought by city people. In some plans, these towns are identified as satellite communities around an economic and cultural center of a population size several times larger. In others, these towns are visualized singly or in clusters as self-contained communities located in a rural setting at considerable distances from any existing large city.

There are two missing elements in this body of theory—a general lack both of effective inter-professional collaboration and of documentary research carried on on the the same basis.

The work of Otis Dudley Duncan, as summarized by Mr. Dahir, provides a beginning point for the kinds of investigations needed. On a modest basis, a team of town planners and social scientists at the University of North Carolina have been making some exploratory investigations of the concept of limited city-size.

Mr. Duncan's work and further investigations at the University suggest that search for a universally applicable optimum city-size may well be equivalent to a quest for the Holy Grail. Some initial conclusions of the North Carolina work indicate that, if an optimum city-size can indeed be determined, it must be derived for each individual setting being examined. It indicates further that the derivation of the best size for any particular city must consider, in addition to qualities of livability, a number of other related factors. For example, there is evidence to indicate that size is affected by the city's economic position in relation to a whole constellation of cities in which each affects the competitive position of the other and thus its ability to sustain a population. There is evidence, too, that community organization and group attitudes exert influences which affect city-size. These and many more factors require studied examination before any definitive conclusions can be reached on the best size for any particular community.

Going a step further, we might well ask whether size should figure prominently in any investigation which is primarily aimed at examining qualities of livability. Size does have the appeal of being a simple yardstick to apply to a city. Yet as a measure of livability, there are indications that other factors may be much more important. For example, a sound economic base is a commonly recognized ingredient of any urban livability formula.

The important conclusion which might be reached from these observations is the need for continuing research. This is not

All clear! Owned by the City of Crookston, Minn., this "Caterpillar" Diesel No. 12 Motor Grader with V-plow and snow wing is busy on snow removal. An essential municipal tool, it also earns its keep by building and maintaining roadways. As a military tool, it's essential for airport construction and maintenance, road construction, the establishment of bases and scores of other earthmoving jobs.

HOW TO GET MORE WORK FROM YOUR "CAT" MOTOR GRADER!

HERE's the situation in a nutshell. The speed, versatility and big work capacity that have made "Cat" Motor Graders so essential a year-round tool for municipal use have also made them essential to the defense effort. As military and Defense Rated Orders must be filled first, you may not be able to obtain prompt delivery of new machines. So it's to your advantage to plan <u>now</u> to get more work and longer wear from your present equipment.

"Caterpillar" Motor Graders are ruggedly built for long life. But good care on your part can lengthen that life span by thousands of extra service hours. Here's how:

1. **Follow the recommended *operating* care in your Operator's Instruction Book. Read and reread it.**
2. **Observe the *maintenance* suggestions in the Operator's Instruction Book. They're down-to-earth—experience has proved them practical and effective.**
3. **Anticipate your future replacement parts needs by seeing your "Caterpillar" dealer about them *now*. Don't wait until wear gets beyond repair—many a part can be rebuilt *if* serviced in time.**

You're in good hands when you work closely with your "Caterpillar" dealer. He is anxious to help you solve your problems. He has the skilled mechanics and service facilities to help you lick them.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

You're the Doctor

Preventive maintenance is good medicine for long life. Right now is a good time to prepare for winter operation of your motor grader. Consult your "Caterpillar" dealer on methods of "winterizing" your machine. Again read your Operator's Instruction Book and refresh your memory on the items of lubricants, fuels and coolants necessary for top performance in bucking winter weather. Don't waste machine life by improper winter care!

CATERPILLAR

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

to suggest that new town developments and programs for limiting the size of existing cities should be deferred until the needed research is completed, but rather to suggest that inter-professional research should proceed concurrently with these developments. It should be carried forward at two levels—at the basic research level and the operational research level. The one might legitimately be a function of the universities and other research agencies where many fields can be brought to bear on the problem, and the other might be considered a function of each local planning agency engaged in a comprehensive planning program. While basic research resources might undertake to examine and, where necessary, redefine broad theoretical concepts of the size and quality of city growth and development, the planning agency might be well advised to place emphasis on the derivation of the particular size and qualities which best fit the needs of its particular regional and local setting.

F. STUART CHAPIN, JR.
University of North Carolina

Editor's Note: A fuller treatment of some of the points Mr. Chapin raises may be found in an article entitled "How Big Should a City Be?" appearing in the Autumn 1950, number of *Planning Outlook*. A limited supply of reprints is available from the Department of City Regional Planning, University of North Carolina, Chapel Hill, at 10c each.

New Federal Director of Housing Research

DR. Richard U. Ratcliff, Director of Housing Research for the Housing and Home Finance Agency, has resigned to return to his professorship at the University of Wisconsin, HHFA Administrator Raymond M. Foley has announced.

Dr. Ratcliff left the University on a year's leave of absence at the end of 1949 to set up the HHFA housing research program authorized by the Housing Act of 1949. His leave was extended at the Agency's request for another six months and his service with the Agency has now exceeded the period agreed upon.

Mr. Joseph H. Orendorff, who has been serving as assistant director of the HHFA Division of Housing Research and as its Chief of Housing Technology, has been named Acting Director of Research by Mr. Foley. Mr. Orendorff has been engaged in architectural and planning aspects of housing with the Federal Government since 1939. Since 1946, he has served in various key capacities in connection with technical and general housing research undertaken by the Agency.

Why Denver Likes Voting Machines

Voting machines have been used in two elections since their city-wide installation in Denver, Colo., in 1950. We have found that the chief advantages derived are savings in the cost of conducting elections and speedy and accurate returns.

In their initial use, more time is consumed in the actual process of voting. In fact, because only one voter at a time can vote on an individual machine, it must be recognized, I believe, that voting by machine will necessarily be a slightly longer process than voting by paper ballot. For example, assume precinct with 700 registered voters with two voting machines. Two persons at a time can be accommodated by the two voting machines. When paper ballots were in use in this precinct, approximately 12 voting booths were utilized with 12 persons voting simultaneously.

From our experience with the use of 560 Automatic voting machines in the two elections, the additional time required to vote would seem to be the only disadvantage.

All things considered, however, and realizing that the so-called time-lag factor will reduce as the voters of the City of Denver become accustomed to voting machines, we are convinced that the advantages of machine voting far outweigh the single disadvantage stated.

ARTHUR CASSIDY, President
Election Commission
City and County of Denver, Colo.

New Officers and Trustees Of G. R. A.

AT THE annual conference of the Governmental Research Association held in Washington, D. C., September 5-7, the following officers and trustees were elected to serve for the ensuing year:

President:
Carlton W. Tillinghast, Executive Director, New Jersey Taxpayers Association

Vice-President:
George Bestrom, Executive Vice-President, Minneapolis Taxpayers Association

Trustees:
Howard Friend, Research Director, Governmental Research Department, Indiana State Chamber of Commerce
Albert J. Richter, Managing Director, Schenectady Bureau of Municipal Research
Calvin Skinner, Director, Cincinnati Bureau of Governmental Research, Inc.
Edward Staples, Executive Director, Missouri Public Expenditure Survey, Inc.
Harland C. Stockwell, Executive Secretary, The Civic Federation (Chicago)

The American City Quiz

ANSWERS TO QUESTIONS ON PAGE 5

1. Mayor Charles E. Slusser, of Akron, Ohio, reports that the cost averages $150 per building. First step is elimination of refuse and waste matter, lumber, firewood, non-metal trash, and rat edibles. Second is to plug all possible entrances. Final is to kill rats in the building.

2. In Cleveland, the cost runs about $3,750 per square mile, or about half the cost of plane-table work, according to Charles M. Hodell, Aero Service Corporation, Philadelphia, Pa.

3. Most feel it better practice to bill water customers in zones. Grand Junction, Colo., follows this practice, and uses a Burroughs billing machine that keeps cumulative totals of water and sewer service charges. Paid bills are receipted in a Burroughs validating machine.

4. Atlanta, Ga., finds them valuable. In 1948 the city burned 110,000 tons of refuse, sold 5,200 tons of tin cans, received $87,129 revenue. The burned cans are sold to a silicon alloy manufacturer who uses them to make ferro-silicon alloys and pig iron. C. W. Mayson is Incinerator Superintendent.

5. Davenport, Iowa, has used successfully either a Sno-Go or a Barber-Greene loader to pick up leaves, according to Ralph Graham, Superintendent of Public Works. He uses the Sno-Go if the leaves are dry, the loader if they are wet, and takes the leaves to people who want them to compost.

6. Yes—15 western and mid-western cities use a spring-wound traffic signal made by the Peters Metal Products Company, of Hawthorne, Calif. It is adjustable to time increments of 20-20 seconds, 30-30 seconds, and 20-40 seconds, and requires one winding per day. It carries Scotchlite-lettered "stop-caution-go" signals.

7. St. Paul, Minn., supplied street lights to its downtown area by installing them on the face of the buildings 26 feet above street level. Harry C. Streich is Superintendent of Lighting.

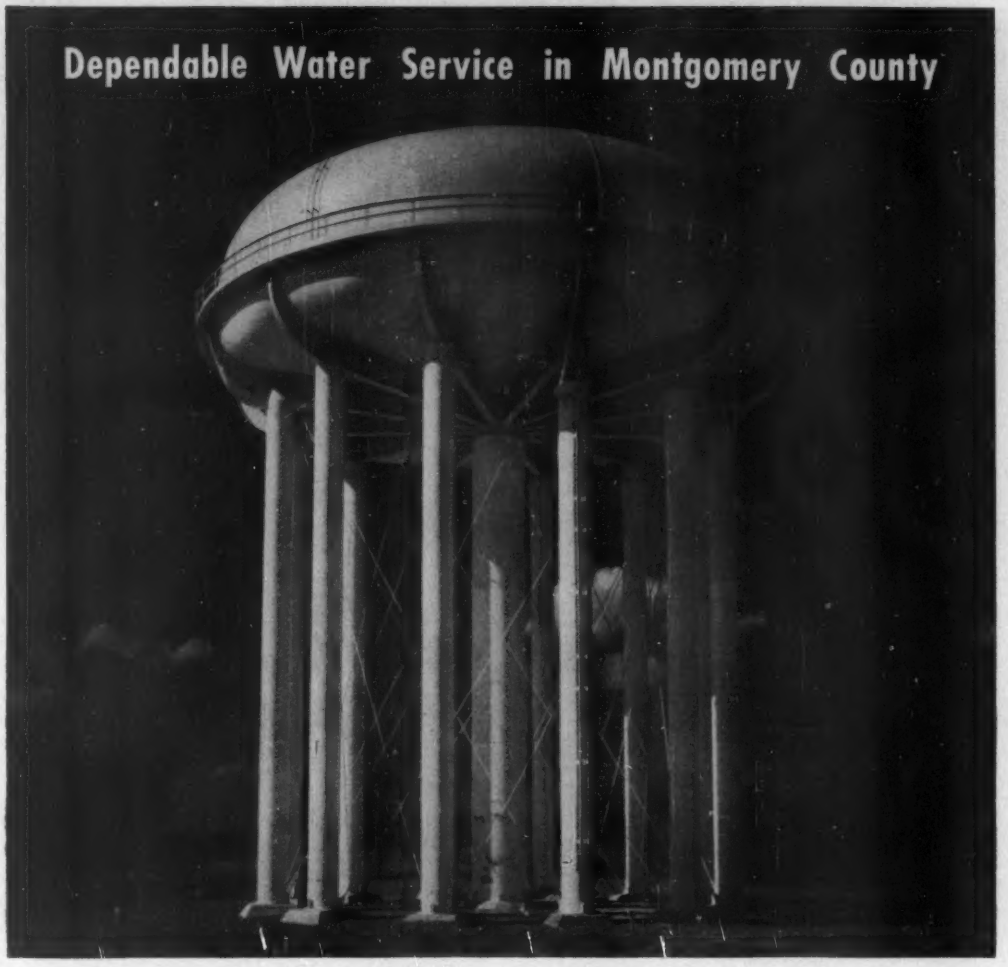
8. The Census Bureau reports in 1949 that the number was 1,281,000, or about 20% of all public employees. Cities employ a little more than half as many as the Federal Government, and about the same number as the state governments.

9. Virtually none, if good health standards are followed, the Illinois Department of Health reports. There is no need to suspect a pool that exercises strict supervision of bathers before entering the pool, that provides thorough water treatment and continuous 24-hour recirculation, or that disinfects the pool to a free residual of 0.5 ppm obtained in all parts of the pool.

10. According to A. R. Todd, Superintendent of Filtration at Wheeling, W. Va., out of every dollar spent on water supply, 33.7 cents goes for chemicals to remove domestic sewage pollution and 43.1 cents goes toward removing industrial wastes.

Send in your suggested questions with the answers on municipal topics for use in this feature. The AMERICAN CITY will make a small payment for each question accepted.

Dependable Water Service in Montgomery County



Montgomery County, Ohio, recently installed this 1,000,000-gallon Horton tank to provide the beautiful suburban area south of Dayton with more dependable water service.

As many communities have discovered, elevated storage results in three important advantages . . . increased water pressure . . . decreased pressure variations . . . and reduced pumping costs. Combine these advantages with modern appearance and it's understandable why Horton elevated tanks serve so many areas throughout the country.

The radial-cone bottom design of the Montgomery County tank was developed especially for large installations. It allows elevated tanks to be built in capacities up to 3,000,000 gallons with a range of only 25, 30, or 35 ft. between the upper and lower water levels.

Horton water tanks are of welded steel construction for lower maintenance costs and longer life. Smooth surfaces are easier to paint and the protective coating is more effective.

Write our nearest office for complete information. There is no obligation on your part.

HORTON

WELDED STEEL

STORAGE TANKS

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3.....2114 Healey Bldg.
Birmingham 1.....1502 North Fiftieth Street
Boston 10.....1002-201 Devonshire St.
Chicago 4.....2127 McCormick Bldg.
Cleveland 15.....2236 Guildhall Bldg.
Detroit 26.....1501 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston 2.....2101 National Standard Bldg.
Los Angeles 17.....1503 General Petroleum Bldg.
New York 6.....3209-165 Broadway Bldg.
Philadelphia 3.....1616-1700 Walnut Street Bldg.
Salt Lake City 4.....501 West 17th South St.
San Francisco 4.....1533—200 Bush St.
Seattle 1.....1301 Henry Bldg.
Tulsa 3.....1625 Hunt Bldg.
Washington 6, D. C.....1163 Cafritz Bldg.

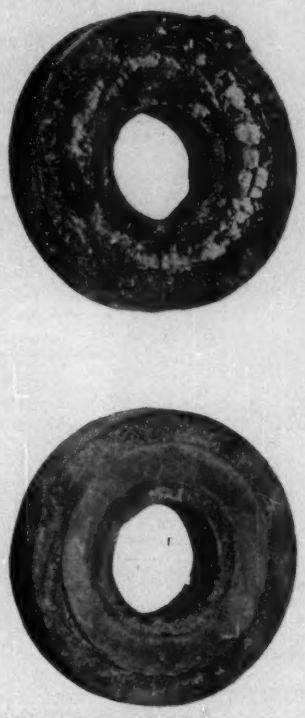
Are Sulphur-type Joints Any Good?

THIS has been one of the most heated questions in the water-works industry in recent years. In order to substitute light for heat, the Atlas Mineral Products Company, of Mertztown, Pa., called on the services of the Maximillian F. Wirtz Memorial Research Laboratory for an investigation. The results of these studies were presented at the American Water Works Association's annual meeting, held recently in Miami, Fla. The answer, according to this impartial laboratory study, was "yes." They can be used with confidence.

Disintegration of sulphur in soils was an important phase of the study, since sulphur-oxidizing bacteria are present in almost all soils and abundant in those rich in humus. The study showed that no reliable evidence has ever been presented to show bacterial attack on sulphur joints in water lines; however, as a precautionary measure, and in order to remove all possibilities of bacterial attack, sodium silicofluoride has been added as a bactericide in the Atlas formula and by two manufacturers of the jointing material.

Disintegration of sulphur compounds also may be encountered as the result of the presence of soluble salts in the formulation. The study points out that the elimination of soluble salts in the jointing compound eliminates this type of disintegration.

The prevention of fractures in cast-iron water mains also came under study, with particular attention directed to failures recorded at San Francisco and Wichita, Kans. The evidence available indicated that the fractures were caused by large external strains. The tests presented the conclusion that in stagnant water, where the difficulty seemed most pronounced, immersion periods of one month caused no strain as measured by strain gauges when the joints were compounded according to the Atlas formula.

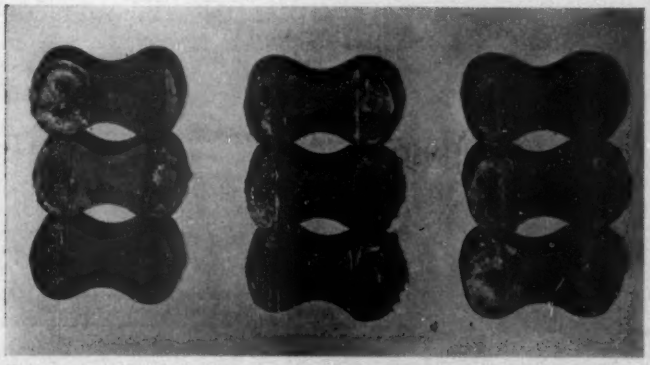


A comparison of the effect of sodium chloride in the Atlas formula on underground disintegration. The sulphur compound in the ring on the top contains 2% sodium chloride; the compound below was soluble-salt-free.

Corrosion problems also required painstaking study, and were based on many tests. The conclusions presented by these tests indicated that a properly poured and correctly formulated sulphur cement does not contribute to deterioration, strain, or corrosion.

The report recommended that sulphur cements not be used in cast-iron pipe under conditions which are corrosive to cast iron itself, nor should they be used under conditions of pH greater than 9. Sulphur, like lead, is attacked by alkalis, and while it is completely resistant to the strongest non-oxidizing acids, its use is not recommended with cast iron at a pH less than 4.

The report concluded by stating that the sulphur joints may be used with confidence under all normal conditions which in turn constitute at least 90% of all pipelines.



Briquettes made with the Atlas formula after 18 months immersion under varied conditions of pH. Briquettes immersed at a pH of 9 cracked after four months.

How to Dispose of Water-Softening Sludge

SLUDGE from a water-softening plant using the lime-soda ash process may be disposed of by:

. . . lagooning or ponding it.

. . . using it as a precipitant in sewage treatment, as is now being done in Daytona Beach, Fla.

. . . dewatering it, drying it, and pulverizing it for industrial use, as is being done by Wright Aeronautics.

. . . dewatering and calcining it in stationary kilns, as is the practice in Marshalltown, Iowa.

. . . dewatering it and calcining it in rotary kilns, as is being done in Miami.

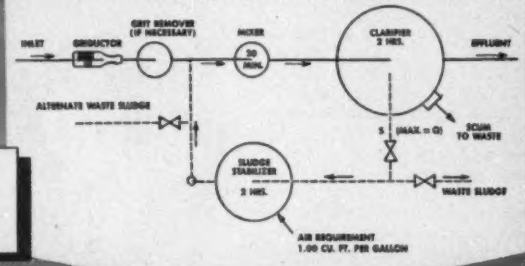
These methods were mentioned in a committee report at the American Water Works Association annual meeting held recently in Miami. The report was delivered jointly by W. W. Aultman, Water Purification Engineer of the Metropolitan Water District of Southern California, and Dr. A. P. Black, of the University of Florida. The report called attention to the Dorr Company "Fluo Solids" sludge recalciner, now under study in pilot-plant stage in Lansing, Mich.

It's NEW!

Infilco's Biosorption Process

Write for data on Infilco's new activated sludge treatment method. Ask for Bulletin No. 6550.

Suggested flow diagram with retention based on average flow of normal strength domestic sewage



RESULTS FROM ACTUAL INSTALLATION

Sewage Treatment Plant, Austin, Texas

THREE MONTHS TEST PERIOD April May June	1 B.O.D. % Reduction	2 SUSPENDED SOLIDS % Reduction
Avg.	93.6	93.7
Max.	98.7	97.7
Min.	89.6	90.6
Avg.	93.6	94.0
Max.	97.7	97.5
Min.	88.0	88.9
Avg.	95.6	96.0
Max.	98.8	99.1
Min.	93.6	92.4

1 B.O.D. % Reduction

2 SUSPENDED SOLIDS % Reduction

RETENTION BASED ON AVERAGE FLOW

Mixer	31 minutes
Stabilizer	2.7 hours
Clarifier	2.4 hours

3 RETENTION

AFTER 12-MONTHS TESTING
in pilot plant studies . . . and now proved by actual installation . . . the Biosorption Process is showing phenomenal results in high-rate biological oxidation sewage treatment.

IMPORTANT SAVINGS
in space requirements and initial investment are brought about with total retention time of only about four hours. B.O.D. and suspended solids reductions compare with the optimum obtained by conventional activated sludge treatment methods. Write today for this important test data on the BIOSORPTION PROCESS . . . ask for Bulletin No. 6550.

INFILCO
BETTER WATER CONDITIONING AND WASTE TREATMENT SINCE 1914

INFILCO, INC., *Tucson, Arizona*

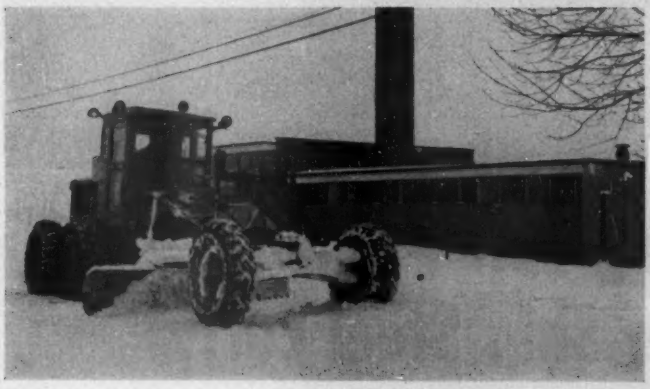
FIELD ENGINEERING OFFICES IN 26 PRINCIPAL CITIES

World's Leading Manufacturers of Water Conditioning and Waste-Treating Equipment

Street Cleaning and Snow Removal

No Sand-Bar Trouble

To keep the Platte River on the straight and narrow, the City and County of Denver use a tractor-bulldozer on the growing sand bars. The tractor, in this case, is a Caterpillar diesel D8.

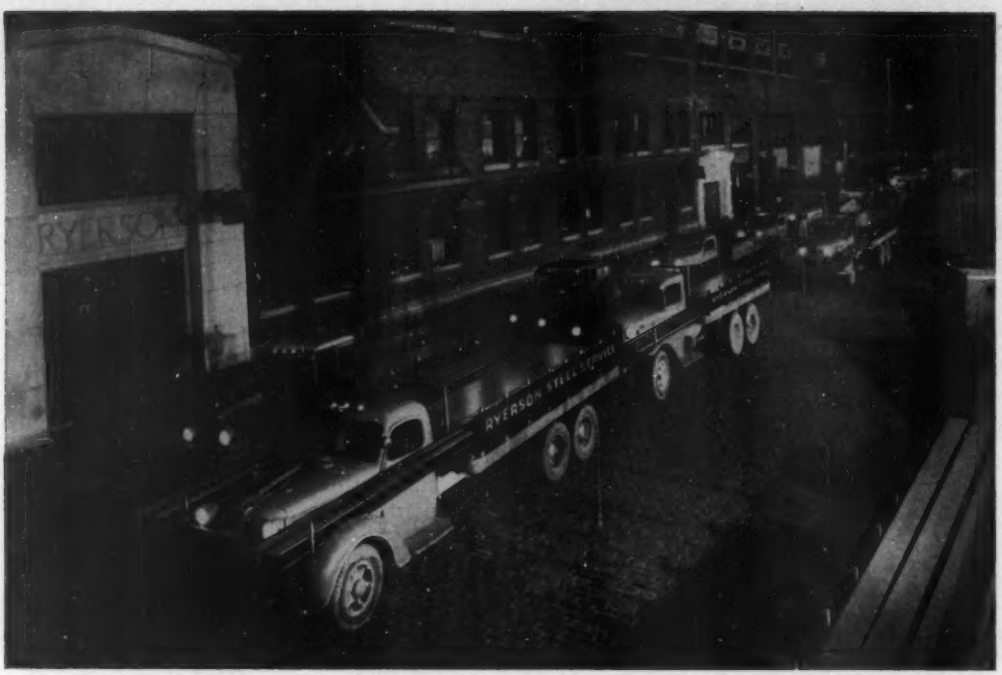


Many-Purpose Grader

A municipality is served best when its equipment can work well on a number of tasks. Ridgefield, Minn., uses this Caterpillar diesel motor grader for street maintenance in the spring, summer, and fall, and for clearing snow in winter. This picture shows the grader clearing a 20-inch snowfall from the streets.

Super Street Cleaning In North Topeka

This is the type of street cleaning that faced North Topeka, Kans., following the recent disastrous Missouri River flood. A Caterpillar No. 112 motor grader helps clear the tremendous deposits of mud and debris from the streets.



Working Late... To Ship Steel Early

Here are Ryerson trucks all loaded by the night shift and ready to be on their way to our customers—early in the morning. This "after-hours" operation is typical of the way we work at Ryerson to speed up your steel deliveries.

Every kind of steel is on hand for quick shipment at your nearby Ryerson Plant. Though stocks are currently out of balance due to ever-increasing defense needs and unprecedented civilian demand, we are still able to serve you.

Your Ryerson representative has specific answers to your questions involving the purchase, application or fabrication of steel. He is fully posted, for instance, on the new alloys and on practical substitutes for hard-to-get steels. So, for any kind of steel—for complete steel service—call your nearest Ryerson Plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished
STRUCTURALS—Channels, angles, beams, etc.
PLATES—Many types including Inland 4-Way Safety Plate
SHEETS—Hot and cold rolled, many types and coatings
TUBING—Seamless and welded, mechanical and boiler tubes
ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel
STAINLESS—Stainless bars, plates, sheets, tubes, etc.
BABBITT—Five types, also Ryertex plastic bearings
MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Sewerage and Sewage Treatment

Pneumatic Ejectors for Sewage Pumping—Where to Use Them

WHEN a city faces the problem of pumping relatively small flows of sewage from outlying districts in its sewerage system, the pneumatic ejector in a great number of cases is showing itself to be ideally fitted to this task. This was pointed out recently by L. J. Nemecsek, of the Ralph B. Carter Company, of Hackensack, N. J., in a paper delivered before the New Jersey Sewage and Industrial Wastes Association in Atlantic City.

The first advantage that the ejector provides is that it needs no bar screen. This automatically eliminates the need to clean the screens, either mechanically or by hand, and the need to dispose of the screenings, and does away with one possible point of breakdown.

Further Advantages

The second advantage is that the unit will function properly with a minimum danger of clogging. Next, it does not require a wet well or a dry pit, nor does the operator have to work in the sewage when maintaining the equipment. Still another consideration is the fact that the unit provides an absolutely positive discharge which can satisfactorily handle all flows entering into the station.

The ejector also provides an esthetic advantage. It eliminates odors or hazardous gases that would make the station troublesome to near-by residents. Finally, the ejector provides enough flexibility of capacity to accommodate itself either to peak loads or very low flows.

The ejector uses a container, or "pot," into which the raw-sewage flow can enter without obstruction, so that anything which can flow through the sewage line can flow through the unit. The pumping portion has no moving parts. It uses two electrodes, one short and one long, which activate an air compressor electrically. The compressor delivers air to the chamber that in turn displaces the contents to the main collecting sewer. Normally, the ejection period for the unit is selected on the basis of allowing it to discharge its entire contents from 15 to 25 seconds; the remainder of the one-minute period allows for the filling of the pot. Actually, the normal rating of the ejector pot consists of the volume of sewage which can be obtained between the operating levels of the electrodes.

The ejector is hermetically sealed and therefore presents no problems in the way of odors or accumulation of hazardous gases. Neither is the operator exposed to the sewage itself.

Where flexibility is important, it is simple to use an air-storage tank which, on a duplex installation, will allow the operation of both ejector pots by running a single compressor. This means that a duplex installation, having two air compressors, can have one compressing unit break down completely and be removed for repair, while the other continues doing the entire work of the station.

Difficulties with material wrapping itself around the electrodes and grounding them has been eliminated by covering the electrodes with a neoprene synthetic coat, exposing only the bottom cross-section of the electrode to actual liquid contact.

Also, difficulties arose during periods of low flow, when most solids have a tendency to drag along to the lift station and then be screened out by the flap of the inlet check valve. To avoid this difficulty, Carter has developed a special 45-degree-angle check valve mounted at 45 degrees, thus creating a zero head on the flapper and allowing the lowest flows to open the check valve easily.

The sewage ejector manufactured by the Carter Company is known as Eject-O-Matic. It is made in four models, whose capacities range from 30 to 150 gpm. They can be built to pump against heads as high as 50 feet.

Operating Results from Daytona Beach Plant

THE Daytona Beach sewage-treatment plant, which employs upflow water-softening as the main sewage-treatment unit, and waste sludge from the city water-softening plant as a coagulant, has demonstrated an ability to remove biological oxygen-demand pollution at an average rate of 65% over a year's operation.

The plant is notable for its small size. Although it serves 70,000 people, it requires less than a quarter-acre of ground area. This is made possible largely because the upflow clarifier, an Infilco Accelator, requires only a 1.6-hour detention period. Furthermore, the sludge cake produced can be dewatered successfully on a vacuum filter without digestion when the disposal is by the sanitary-fill method with the rest of the city refuse.

To determine the efficiency of the plant, the city retained the services of John J. Hamilton, of the American Water Works Company, to operate the plant and make laboratory determinations. The monthly summary of his findings are as follows:

Month	Flow (mgd)	% Moisture Vacuum Filter Cake	BOD (ppm) Raw	BOD (ppm) Effluent	% Removal
1950					
May[1]	2.8	41.5	224	61	72.8
June	2.9	43.4	179	69	64.2
July	3.6	44.5	177	70	60.4
August	3.1	49.0	204	65	68.6
September	3.2	47.8	147	55	62.5
October[2]	5.2	49.6	154	51	66.9
November	4.7	45.7	157	57	63.6
December	3.9	46.8	176	75	57.4
1951					
January[3]	3.9	52.0	165	105	36.4
February	4.2	48.1	229	98	57.1
March	2.8	48.2	283	77	72.8
April	2.5	49.6	295	84	71.5
Average	3.6	47.2	199	72	65.3[4]

[1] Mr. Hamilton was employed by the city during the month of May 1950 and did not conduct the laboratory work for this entire month. The remainder of this table is based on Mr. Hamilton's work.

[2] For most of the time during this year, only one of the two Accelator tanks was operated. In October, when the highest sewage flows were recorded, only one Accelator was used. During the month the average flow was 5.2 mgd, thereby developing a very considerable overload on the single Accelator, which was rated for an average flow of 3 mgd. Even with this overload, the treatment efficiency was not impaired.

[3] During the month of January 1951, improvements were in progress at the local water-softening plant that made it impossible to discharge waste water-plant softening sludge to the sanitary-sewer system. This resulted in the expected drastic reduction of sewage-treatment efficiency. In fact, without the calcium carbonate, the Daytona Beach Process efficiency dropped to the efficiency that might be expected from ordinary good primary sedimentation.

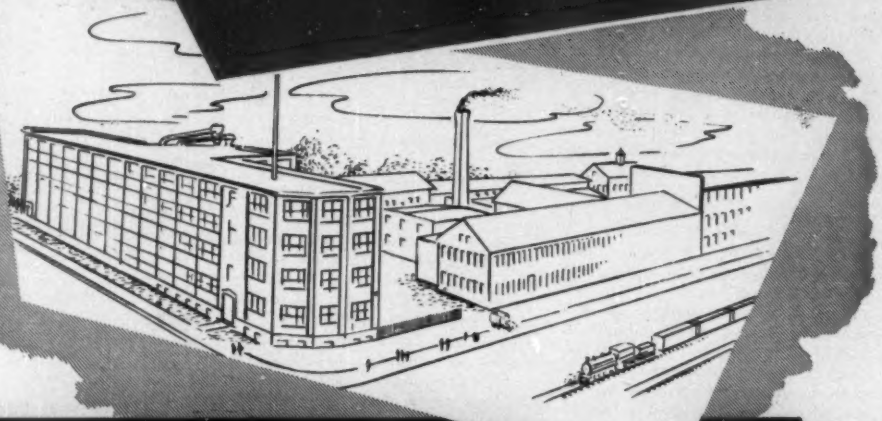
[4] This yearly average percentage of BOD removal is an average for 11 months and does not take into account the month of January 1951, when the plant was not being operated as the Daytona Beach Process for the reasons noted above.

Public Health Filmstrips

Films and filmstrips are available from the Public Health Service of the Federal Security Agency, covering subjects relating to public health ranging all the way from anatomy to veterinary medicine. The films are suitable for professional and sub-professional groups. Of particular interest to municipalities are the films on sanitary-engineering subjects of sewage and refuse disposal, and also the subject of rat-borne disease control.

Listings of available films and filmstrips may be obtained by writing the Communicable Disease Center, Public Health Service, Atlanta, Ga.

100 Years
IN THE PUBLIC SERVICE
1851-1951



During 1851, in the City of Boston, Massachusetts, was made the first practical application of the Morse telegraph to fire signaling, providing a public and always accessible means for calling the fire department. John N. Gamewell shortly thereafter, acquired patent rights for the system of fire signaling thus applied in Boston and which has since become universally known as The Gamewell Fire Alarm System.

The well estabished reputation for reliability, durability, and efficiency of Gamewell equipment, produced by a small force of highly skilled workmen, has resulted in the widespread use of The Gamewell System not only in the U. S. A. but also in many other countries.

The Gamewell Company, lineal successor to John N. Gamewell, deeply appreciates the widespread confidence in its products and will continue to incorporate therein features dictated by 100 years experience that are essential to the protection of life and property.

The GAMEWELL COMPANY
NEWTON UPPER FALLS 64, MASSACHUSETTS
IN CANADA: NORTHERN ELECTRIC COMPANY, LTD., BELLEVILLE, ONTARIO

Public Safety

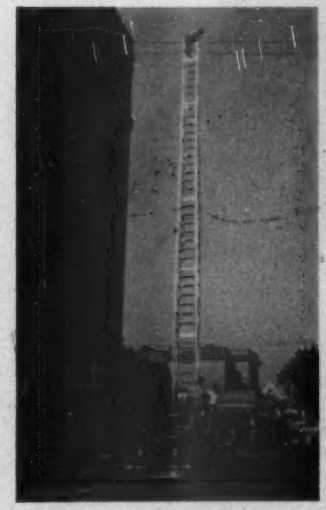
The Fire Fighters of The Red River Valley

TWO of the oldest fire fighters in the State of Louisiana are Chief R. A. Neff and Assistant Chief W. H. McCracken of Alexandria. This city of 40,000 people, on the banks of the Red River, owns all its utilities—water, electric, gas, and bus service. Its six square miles contain modern parks and playgrounds. Over this area are four fire stations, and a fifth is under construction.

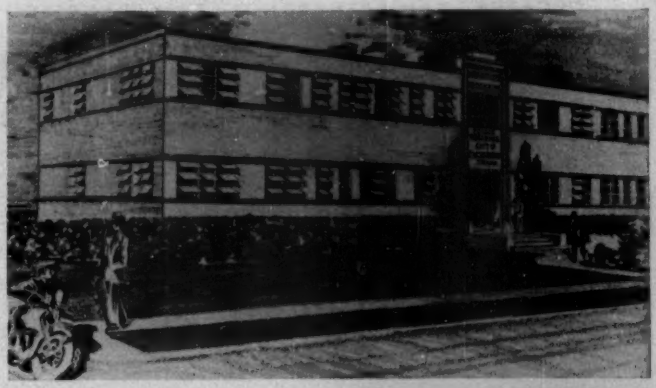
The department comprises 70 paid men, and their equipment includes six pumping engines, an 85-foot aerial, and a 65-foot aerial. All apparatus is equipped with Motorola two-way radio. The men work 72 hours a week on the double-platoon system. The Gamewell fire-alarm system consists of a 10-circuit switchboard and 189 street boxes.

Chiefs Neff and McCracken entered the department when it went from volunteer to fully paid on June 6, 1907, and participated in the transition from horses to motors in 1914. The first pieces of motorized fire apparatus were a Seagrave combination truck and a Seagrave city-service truck.

The latest trucks were paraded on October 7, 1950. They consist of three 750-gpm and one 1,000-gpm pumping engines and an 85-foot aerial all Seagrave.



Shown in operation is the 85-foot aerial ladder, a recent acquisition of the Fire Department of Alexandria, La.



Above is the architect's sketch of the $250,000 public safety building soon to be completed in Corpus Christi.

New House for Public Safety in Corpus Christi

SHOWN here is the new police building of Corpus Christi, Texas, which was voted for with three other buildings —auditorium, city hall, library—by the people of this city last December. Designed by Morris Levy, architect, the structure will be completed in 1951.

The main floor will include the courtroom, file room, offices for the police chief and his assistants, the heads of the traffic division, and an assembly room. Also included in the first floor plan are the identification file offices, photo lab, fingerprint lab, and radio and dispatcher room.

On the second floor, the jail block, with room for 90 prisoners, is designed to provide a prisoner corridor and a guard corridor which serve as a separation between the jail block and outside windows. This removes the view of the jail from the outside and makes the second floor look the same as the first floor. The jail-block design facilitates the handling of prisoners, and permits additions to be made without disturbing the outside wall structure. Jail equipment, costing $71,160, was furnished by the Southern Steel Company, of San Antonio. The company also supplied an electrically operated de-louser, manufactured by the Fred Frank & Company, 900 E. Main St., Louisville, Ky.

The offices will be air-conditioned, walls will be of glazed tile, with terrazzo floors. Over-all dimensions are 122 feet by 50 feet.

The "X"-shaped reflective belt.

Making Officers Visible At Night

THE Scotchlite "X"-shaped belts used by the Quincy, Mass., police department give the officers greater protection after dark and permit nighttime motorists to spot the officer and follow his directions more readily. Each man on Quincy's police force has a belt to make him highly visible at night. The belts light up at night without wiring, bulbs, or electricity.

Law-enforcement agencies in other metropolitan sections of the nation are also adopting reflective markings for their officers' wardrobes. Chicago has provided reflectorized "V"-shaped belts for more than 800 traffic officers.

In Los Angeles, 250 traffic officers have reflectorized hat-bands; their fleet of three-wheeled motorcycles are striped with Scotchlite. Hands that glow at night distinguish traffic officers in Dallas, Texas, who wear gloves covered with the reflective fabric.

LITTLE ROCK BERKELEY ATLANTA LONG BEACH LOS ANGELES
DECATUR SAN BERNARDINO SAN FRANCISCO BOSTON DETROIT
SOMMERVILLE OMAHA GREAT BEND FLINT AC PORTLAND
JERSEY CITY RHINELANDER
CORNING ER, HAWTHORNE
TORONTO NG BRANCH
BANNING ON LAKEWORTH
ENGLEWOO ALBERT LEA
CHEHALIS IA AUBURN
BAY CITY ND LYONS
TORRANCE SALINAS
ATHENS ARCADIA
IDAHO FALLS PONTIAC MAPLEWOOD
TERRE HAUTE ASTORIA NEW YORK CITY LUBBOCK PORT ARTHUR
CENTRALIA FLINT CASPER YAKIMA VANCOUVER, B.C. CAN.

OVER 200 CITIES COAST TO COAST!

MORE AND MORE CITIES across the nation are reporting important savings on street sanitation costs with the WAYNE Model 450 Pick-Up Sweeper... savings on *equipment*, on *manpower*, on *operating costs!*

These same savings can be yours—regardless of the street sweeping method you are now using. Only WAYNE gives you the speed and the effective hopper capacity to make low cost central dumping practical...only WAYNE can sweep and haul away to disposal over 3 cubic yards of dirt—at traffic speeds.

The full story on the WAYNE Model 450 Sweeper is yours for the asking. Find out—today—why large and small cities alike are picking WAYNE as the one economical solution to street sanitation problems! Write.

Wayne Model 450 Pick-Up Sweeper

WAYNE
PICK-UP
SWEEPERS

WRITE FOR THIS BULLETIN—It illustrates and describes such outstanding Model 450 features as—practically indestructible non-clogging dirt elevator...largest effective hopper capacity of any sweeper...low body design for full forward vision...forward 42" gutter broom...hydraulic controls...full floating broom suspension...and a dozen other features you should know.

Sold and serviced throughout the United States by a fine distributor organization.

WAYNE MANUFACTURING COMPANY
MANUFACTURERS OF STREET SWEEPERS
1201 East Lexington Street, Pomona, California

Refuse Collection and Disposal

Sanitary Landfill Demonstrations Held in New Jersey

THE increasing interest of small municipalities in good refuse disposal was reflected in the record attendance (approximately 350) at a sanitary-landfill seminar and demonstration held in Cranford, N. J., on May 23.

Health officers, sanitarians, and other municipal officials from all parts of the state attended. The program was jointly sponsored by the Township of Cranford (Union County); the Township of Neptune (Monmouth County); the New Jersey State Department of Health, and the United States Public Health Service.

The morning session was held at the Cranford Township hall, and William Smith, Health Officer of this township, discussed the public-health advantages of the sanitary-landfill method of disposal. John Zemlansky, of the State Department of Health, followed with a discussion of the economic advantages. The engineering aspects were reviewed by Patrick J. Grall, Township Engineer of Cranford; and equipment needs, operation, and care were outlined by John W. Drott, vice-president of the Drott Manufacturing Company, Milwaukee, Wis. Over-all benefits of this type of garbage and refuse disposal were summarized by Robert D. Murrill of the New York office of the United States Public Health Service. In addition to the talks, a film was shown.

A tractor and Bull Clam show how to cover compacted refuse.

The afternoon session consisted of a field demonstration of sanitary-landfill techniques at the Cranford dumping area. An International TD18 A with a Drott Bull Clam shovel, owned by the City of Neptune, was used to demonstrate the method of trenching, spreading, compacting, and later backfilling the area being worked. A Caterpillar D4 with a Traxcavator was also demonstrated.

The Township of Neptune is the first in the State of New Jersey to adopt the sanitary-fill method of refuse disposal. This demonstration was one of several conducted by the United States Public Health Service and various state departments of health.

Public Works Men See New Use for Fogger

A refinement in refuse sanitation was demonstrated at the New York-New Jersey Chapter meeting of the American Public Works Association, held recently in New York City. The demonstration was conducted by Todd Shipyards Corporation, of Elmhurst, L. I., and showed how a Tifa fogger could be used to give a final measure of sanitation to the trucks. The fog so applied could carry any of a number of disinfecting or odor-correcting chemicals. At the left, the fogger makes its application into the open receiving hopper of the truck. Above, note the complete penetration of the fog as it seeps from openings in the truck body.

New Adams TraveLoader

Unequalled for fast loading of windrowed material - Summer or Winter

This Adams TraveLoader is owned by the City of Roanoke, Virginia. Public Works Director J. L. Wentworth declares it ideal for city work.

Above Adams TraveLoader is loading snow in Edmonton, Alberta. Machine is also used to load dirt, gravel, etc. on city projects.

Cities all over the country have found the new Adams TraveLoader one of the most useful machines they could possibly own. Self-propelled and self-feeding, the TraveLoader picks up and loads all kinds of windrowed material—dirt, sod, gravel, sand, bituminous mix, scarified black top, snow, wet leaves, etc.—and does it faster and cheaper than any other machine or method.

Important TraveLoader features include: HIGH, CENTRALLY-LOCATED CONTROL STATION—for unobstructed vision. • HIGH-SPEED REVOLVING FEEDER—for greater over-all production • HEAVY-DUTY INDUSTRIAL-TYPE ENGINE—for dependable, low-cost performance. Ask your local Adams dealer for full information on this remarkable machine.

J. D. ADAMS MANUFACTURING COMPANY • Indianapolis, Ind.

Adams

Some Pertinent Facts About Asphalt

ASPHALT exists in solution as one of the components of petroleum, and is produced by evaporating the lighter solvent oils. This may be accomplished by distillation in a modern refinery, or it may have been done slowly through the ages by nature. It is a hydrocarbon, composed approximately of 20% hydrogen and 80% carbon.

The most famous instance of nature's refining is the asphalt lake on the island of Trinidad in the West Indies. Deep in the earth, nature has heated a crude oil for untold centuries and converted it to asphalt. Columbus is supposed to have caulked his ships with asphalt from this lake.

Less famous are the Bermudez asphalt lake in Venezuela and the LaBrea asphalt pit near Los Angeles, where skeletons of prehistoric monsters have been uncovered.

These native asphalts are refined at least to the extent of boiling away the water that is mixed with them.

Asphalt also occurs in the pores of some sandstones, notably in Kentucky and Alabama. The asphalt rock is quarried like any other rock, crushed to size, and sold as "rock asphalt."

More than 90% of the asphalt marketed today, however, is refined from petroleum in modern refineries. This production has increased from 20,000 tons in 1902 to 12,000,000 tons last year.

The oldest and most common method of producing asphalt in a refinery is the distillation process as employed in a fractionating tower.

When petroleum is heated, numerous products are vaporized, one after another, as the heat is increased. At less than 100°F., gasoline and solvents are vaporized. Light oils are vaporized at 150°F., and then with increasing temperatures, heavier oils and finally asphalt are produced.

Modern Refinery Methods

In the modern refinery, however, there is a better method of extracting the maximum amount of gasoline from crude, and gasoline is usually the chief product sought. The oil is first run through a fractionating tower at temperatures just sufficient to drive off the light ends. The resultant residue, called "topped crude," is then sent to a vacuum flasher where, under high heat but in a vacuum which prevents cracking, the greater portion of the topped crude is separated and sent as charging stock to the "cat cracker," those 20-story structures that wring the utmost of gasoline from the charging stock.

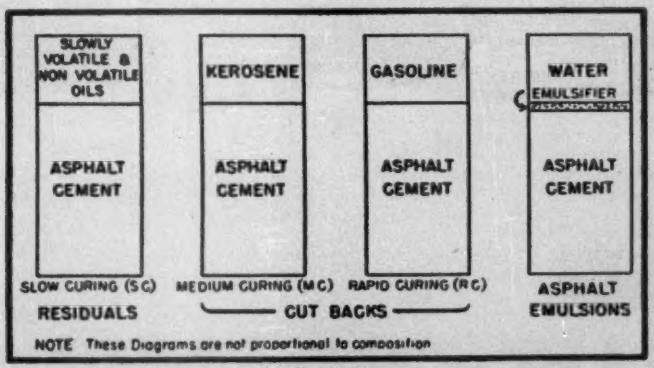
The residue left in the vacuum flasher is asphalt. This is produced in hard and soft grades which are then blended to the penetration grades specified.

Cutbacks are produced by carefully blending selected grades os asphalt, in specified proportions with light solvents such as gasoline and mineral spirits to produce rapid-curing grades. Asphalt is blended with light oils to produce medium curing cutbacks, and with heavy oils to produce slow-curing cutbacks. Light road oils are usually produced from thermal cracking in another section of the refinery.

Emulsions are made in an emulsion mill, where hot asphalt is ground into microscopic particles which are mixed with soft warm water in the presence of a very small percentage of an emulsifying agent, such as a resinous soap. The emulsifying agent holds these asphalt particles in suspension in the water. When crushed stone or gravel is coated with emulsion, the water evaporates and the asphalt is left as the binding agent.

It should be noted that the water in the emulsion is there for the purpose of workability, just as the gasoline or the kerosene is in a cutback. In each instance, when the volatile component has evaporated, the asphalt is left to do its work. Thus, whether we are working with a paving grade of asphalt cement, or a cutback, or an emulsion, it is the asphalt that is finally to bind the particles of aggregate together to form the roadway surface.

(Taken from a paper by Harold L. Tilton, Manager, Asphalt Department, Shell Oil Co., Chicago, Ill., at the University of Wisconsin, Institute on Bituminous Roads.)



Cut-back asphalts and asphalt emulsions are mixed approximately as shown.

How to Get A Good Seal Coat

TO GET a good seal coat, first be sure that the surface to be treated is free of dirt and dust that would prevent the bituminous from adhering. The bitumen must be applied at a temperature that will allow adherence both to the surface and to the cover aggregate. The weather conditions must be such that the bitumen does not set up before covering with aggregate. Also, the application of bituminous material should not be rained on before it is covered with aggregate.

Bituminous spreading should proceed slowly enough for the covering operation to follow closely, so that aggregate can be imbedded into the asphalt. The colder the weather, the closer the two operations should be.

The application of bitumen must be sufficient to provide a mastic one-half the depth of the cover stone. The cover aggregate must be surface-clean when placed. It also must be dry. Cold, wet aggregate will not bond with the bitumen. Prompt rolling is required.

These points were explained by Daniel E. Gaffney, Assistant Engineer of the Construction State Highway Commission of Wisconsin, at the recent Bituminous Road Institute held at the University of Wisconsin.

Here's what WE mean by

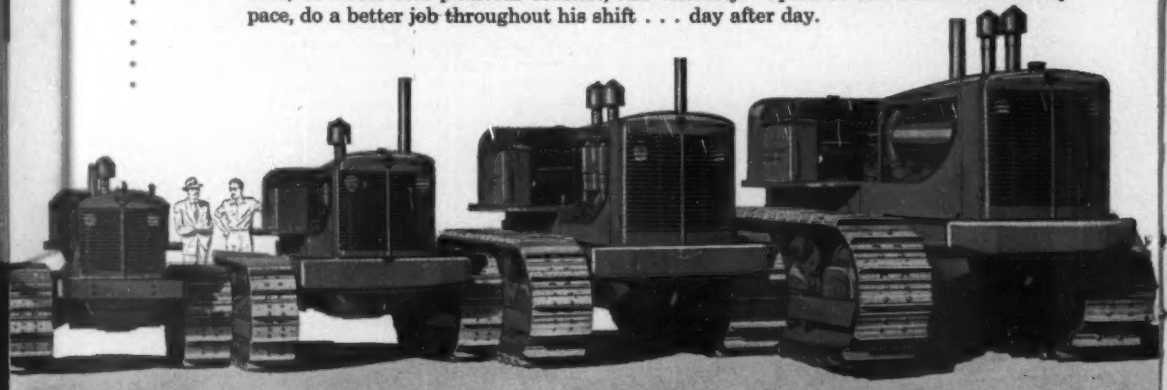
The Newest, Finest Tractor Line on Earth!

DESIGNED FOR YOUR JOB These Allis-Chalmers tractors are *new from the ground up* . . . without compromise anywhere in design or material. They are built to give you outstanding performance on any job, with any equipment—drawn or mounted. Fully matched line of Allied equipment!

BUILT TO "TAKE IT" These are the finest tractors ever built . . . with ample capacity and strength in every part! You can depend on them to take the loads and jolts of today's jobs . . . because they are modern tractors built for the most gruelling operating conditions. They will more than measure up to your expectations!

EASY TO SERVICE Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these tractors are the easiest to service and repair. This all adds up to less down time, more producing time . . . longer tractor life at less upkeep cost.

EASY TO OPERATE Conveniently located controls respond to the slightest effort . . . and are operated in the same familiar way — nothing tricky to "catch on to." There is new shifting ease, new seat and platform comfort, full visibility. Operator can maintain a steady pace, do a better job throughout his shift . . . day after day.



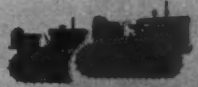
HD-5
40.26 drawbar hp.
11,250 lb.

HD-9
72 drawbar hp.
18,800 lb.

HD-15
109 drawbar hp.
27,850 lb.

HD-20
Hydraulic Torque Converter Drive
175 net engine hp. 41,000 lb.

YEARS AHEAD



Each of these new Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each sets new standards in its class for performance, strength, servicing, operation. Get the full story from your Allis-Chalmers dealer NOW on this — The Newest, Finest Tractor Line On Earth.

ALLIS-CHALMERS

TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

Wooden Tripods Protect Runway Lights

HIGH-INTENSITY runway lights at the New York International (Idlewild) Airport were protected against damage by field construction trucks and other construction equipment which used the runways during the construction period. The contractor constructed unique tripods of 2-by-4's. They were painted white for maximum visibility both day and night, and they are reported to have saved many a light breakage.

The light in the foreground is a Westinghouse Type HL high-intensity unidirectional unit with two main beams—one for each direction of landing. A low-intensity bidirectional optic is mounted on the top for use in clear weather.

The light directly behind is a Line Material controllable-beam type high-intensity bidirectional unit. It throws two main beams of light from one light source. The beam-control device consists of a small motor in each light which shifts the lamp in relation to the fixture lens so as to swing the axis of the beam laterally in order to compensate for reduced atmospheric transmission of the light beam. The beam-control panel, of course, is in the control tower. The New York International Airport is operated by the Port of New York Authority, and all design and construction work is done under its supervision.

One of the "non-drooping" and longer-lasting plywood flags is shown in use.

Plywood Flags Last Indefinitely On Airport Vehicles

PLYWOOD "flags" ¼-inch thick, used for marking the airport trucks, cars, and other field vehicles at the Washington National Airport at Gravelly Point, Va., are always in their best marking position and they last almost indefinitely. These flags are painted yellow for maximum visibility. Previously, yellow flags made from standard bunting material lasted only a few days, and very frequently became ineffective by twisting themselves around the poles. On windless days the bunting flags hung limply when the vehicles were not in motion, and were of little or no marking value. The plywood flags require no maintenance, except an occasional painting, and can be made of scrap plywood.

The plywood flags are used on vehicles working in the field regularly. Other vehicles still use the cloth flags, according to B. H. Griffin, Director, Washington National Airport.

Wooden tripods offer adequate protection to high-intensity runway lights.

Hinged Wind-Cone Standard Aids Servicing

HINGED standards for wind cones not only save time in the servicing of the cone, but they aid the maintenance electrician in replacing burned-out lamps in the wind-cone lighting reflectors and obstruction light. With this type of mounting, the cone can be installed so that the center of the cylindrical cone support is 16 feet from the ground, as required by CAA Specification L-807.

The heavy counterweight at the bottom of the pole support balances the light fixture and cone assembly during the tilting process. A concrete base at least 4½ feet deep is required to support the standard properly. The picture shows the Crouse-Hinds installation at the Newark, N. J., airport. The wind cone is installed at the center of the 100-foot-diameter circular airport marker, made up of a 4-foot-wide band of ⅜-inch-diameter limestone (crushed white) 2 inches thick.

This airport is operated by the Port of New York Authority.

Hinged standards eliminate need for ladders when servicing this wind cone.

"...ENGINE STILL IN EXCELLENT CONDITION AFTER 7,000 HOURS' OPERATION THANKS TO TEXACO URSA OIL X**"

Taken down after 7,000 hours of rugged service in a rock quarry, this Caterpillar Diesel D-7 bulldozer engine was in excellent condition. Piston rings were all free, wear was so negligible that the crankshaft was reinstalled without any work having to be done on it. *Texaco Ursa Oil X***** was used exclusively in this record achievement.

*Texaco Ursa Oil X***** is detergent and dispersive, it keeps engines clean . . . free from harmful carbon, gum and sludge. This, plus a high resistance to oxidation keeps rings free, ports open, valves functioning properly for better compression and combustion. *Texaco Ursa Oil X***** assures full protection for bearings . . . less wear . . . reduced maintenance costs and fuel consumption.

Let a Texaco Lubrication Engineer tell you about the Texaco Simplified Lubrication Plan and the economies it can bring you. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd St., New York 17, New York.

Three Other Texaco Cost-savers

1. *Texaco Marfak* — Tough, adhesive and cohesive, assures longer life and lower maintenance costs for chassis parts. *Over 400 million pounds of Marfak have been sold!*
2. *Texaco Marfak Heavy Duty* — Greater protection and longer life for wheel bearings . . . no seasonal change required.
3. *Texaco Track Roll Lubricant* — Reduces wear and lengthens life on crawler track mechanisms.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

Get What You Want—No Charge

Please check over the list of interesting free catalogs on this and following pages. To obtain the literature you want, write directly to the manufacturers at the addresses given. If you prefer, you may circle the identifying numbers on this coupon and mail to THE AMERICAN CITY, *470 Fourth Ave., New York 16, N. Y., and we will see that catalogs are sent to you without expense or obligation.* 10/51

903	904	905	906	907	908	909	910	911	912	
913	914	915	916	917	918	919	920	921		
922	923	924	925	926	927	928	929	930	931	
932	933	934	935	936	937	938	939	940		
941	942	943	944	945	946	947	948	949	950	
951	952	953	954	955	956	957	958	959		
960	961	962	963	964	965	966	967	968	969	
970	971	972	973	974	975	976	977	978		
		979	980	981	982	983	984			

Name ..... **Position** .....

Address .....

Air-Raid Warning Sirens

903 Complete air-raid warning is furnished by the Super siren and the Vertical siren manufactured by the H. O. R. Co., Inc., 40 Broadway, Staten Island 10, N. Y. Available in 15 and 40-hp sizes, the Super siren can be rotated and will provide wide coverage at low cost. Vertical sirens built in 7½, 5, 3, and 2-hp sizes, are used to overcome high-level noises in certain areas.

This 28-mph Machine Has Varied Usage

904 The 28-mph D Tournapull, a product of R. G. LeTourneau, Inc., Peoria, Ill., is able to speed various jobs throughout the city. It spreads, compacts, and covers garbage; handles maintenance jobs; plows and removes snow, and grades, widens, and straightens streets. Complete information will be supplied by the manufacturer.

Traffic Control by Cones

905 The "safety of rubber" and "authority of steel" are the claims of the Interstate Rubber Products Corp., 908 Avila St., Los Angeles 12, Calif., in reporting on its Trafficone system of traffic control in its illustrated manual. These Trafficones require a minimum of storage space and are easy to handle.

Curb Stops

906 The A. Y. McDonald Mfg. Co., Dubuque, Iowa, will send illustrated information on its water-works brass goods. The manufacturer's new copper-to-copper stop and drain, E-3519, provides full-size, free water-way, and assures trouble-free operation. Available sizes are ⅝, ½, ¾, and 1 inch.

Speed, Portability, Power In Air Compressors

907 Public works crews, such as those assigned to water, sewer, and street maintenance, often need air compressors with plenty of power, and need them quickly. The truck-mounted, truck-engine powered Jaeger Travel-Air fills such requirements. This combination carries a compressor able to deliver 125 cubic feet of air at 100 psi. The cost goes down because one engine serves the compressor and the truck. Get your folder on this unit from the Jaeger Machine Co., Columbus 16, Ohio.

Need Diesel Engines?

908 The Cooper-Bessemer Corp., Mount Vernon, Ohio, and Grove City, Pa., offers five stationary engine types in a power range from 290 to 3,700 bhp. Each type comes either atmospheric or supercharged; offers a variety in the number of cylinders, and most are available as gas engines, gas-diesels, or full diesels.

Throws Snow 40 Feet In Any Direction

909 The Maxim Snow Thrower casts snow 40 feet in any direction, does not build up banks, and handles wet or dry snow. The self-propelled machine is a product of The Maxim Silencer Co., 84 Homestead Ave., Hartford 1, Conn., which reports that this equipment soon pays for itself.

Guard Against Pipe Corrosion

910 Pitt Chem tar base pipeline enamel is a basic material of the tough metal-preserving sheath that guards thousands of miles of the nation's underground pipelines from corrosion. The Protective Coatings Division of the Pittsburgh Coke and Chemical Co., Grant Bldg., Pittsburgh 19, Pa., reports that its product is easy to apply and dependable in service. Write for printed matter on Standard, Modified, and Plasticized grades of Pitt Chem pipeline enamels and primers.

Push-Button Operation Controls All Valves

911 *LimiTorque Catalog L-50* will be sent on request on business letterhead by the Philadelphia Gear Works, Inc., Erie Ave. and G St., Philadelphia 34, Pa. According to the manufacturer, the LimiTorque push-button operation is cheaper, safer, positive, dependable, and automatic. LimiTorques are available for all types of valves and may be supplied for actuation by any power source.

Truck and Loader Combined

912 The new Holmes-Owen truck loader, manufactured by the Ernest Holmes Co., Chattanooga, Tenn., makes loading and hauling a one-man operation. The hydraulically operated unit permits the truck driver to do his own light digging, grading, loading, and cleaning up without the need for additional manpower. The loader lifts ½ yard per bucket, and loads the average truck in 4 minutes. It can be installed on most 1½- to 2½-ton trucks.

Garbage-Elimination Plan

913 A modern, sanitary, and economical method of disposing of garbage, is the Hotpoint Municipal Plan which eliminates food-waste before it becomes garbage, reduces garbage collection costs, and provides health protection for members of all families. Hotpoint's Municipal Plan of food-waste disposal employs the Hotpoint Disposall, a food-waste disposer that is easy to install in any kitchen or hotel sink. Full details will be supplied by the Hotpoint Disposall Dept., 5600 W. Taylor St., Chicago 44, Ill.

Tractor Shovels

914 The Frank G. Hough Co., 710 Sunnyside Ave., Libertyville, Ill., has published *Catalog No. 217* for public works departments, contractors and utilities. Entitled, *Profitable Construction with Payloaders*, this publication contains on-the-job photographs of earth-moving, material-handling, lifting and carrying jobs being performed by the multi-purpose tractor-shovels known as Payloaders.

Identification Necklaces For Civilian Use

915 The Bead Chain Mfg. Co., 24 Mountain Grove St., Bridgeport, Conn., produces an identification necklace for civilian use. It is flexible so that it cannot kink, is economical, attractive, comfortable, and strong. Accepted as standard by the Armed Forces, the product is being issued for use by school children.

Municipal Castings

916 *Catalog R* is a 135-page publication released by the Neenah Foundry Co., of Neenah, Wis., and 308 W. Washington St., Chicago, Ill. It illustrates various types of construction castings for municipal use and construction projects.

Uniform Fabrics

917 Metcalf Bros. & Co., 45 E. 17th St., New York, N. Y., manufactures uniform fabrics. Available are 12 to 18-ounce serges, tropical weight for shirtings, 18-ounce whipcord for breeches, and 20 and 30-ounce beavers, as well as other standard fabrics. Write for informative literature.

This Line Locator Eliminates Guesswork

918 The Wilkinson line locator is a lightweight, compact, and precision locater. It eliminates guesswork because it quickly spots couplings, boxes, mains, services, stubs, and valves. The electronic sleuth locates every part of underground pipe system, and shows the depth of lines. The manufacturer, the Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena 3, Calif., will send complete details on its equipment.

Elevated Water Reservoirs

919 Hammond water reservoirs are built to AWWA standards and specifications, and provide safe, dependable water storage. Elevated tanks, towers, and standpipes are manufactured by the Hammond Iron Works, Warren and Bristol, Pa. Write for literature describing the equipment.

(Please Turn to Page 27 for More Literature)

THE FIRST MECHANICAL JOINT TAPPING SLEEVE AND VALVE

ELIMINATES { **MELTING** **POURING** **CAULKING**

A new *all* Mechanical Joint Tapping Sleeve and Valve, installed quickly and easily even by untrained workmen using a ratchet wrench. There are no joints to pour and caulk.
Installation can be made in wet trenches in any kind of weather.
The "Stuffing Box" type joints require no cutting or scarfing of rubber gaskets on job. Assemble Sleeve on main—attach the Valve, the installation is complete and the joints are permanently bottle-tight.

32

GATE VALVES
CHECK VALVES
FIRE HYDRANTS
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.
ESTABLISHED 1896
EAST ORANGE, NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
PIPE CUTTING MACHINES
CORPORATION TAPPING MACHINES

Which Catalogs Interest You?

Write directly to the manufacturers, or use the coupon on page 25

Protection for Steel Water Lines

920 The spun lining of Bitumastic 70-B enamel on the inside of water pipe protects interior surfaces against corrosion and tuberculation. It also protects the outside of the pipe against pitting and leakage caused by soil corrosion. Bitumastic enamels are produced by the Koppers Co., Inc., Tar Products Division, Dept. 922T, Pittsburgh 19, Pa.

Fast-Cutting Chain Saw

921 The new lightweight DO-101 Disston one-man chain saw is equipped with Disston's new fast-cutting "DF" chain. Running on a narrow profile slotted guide rail, this chain cuts a kerf that minimizes binding. Illustrated printed matter will be sent by Henry Disston & Sons, Inc., I-11 Tacony, Philadelphia 35, Pa.

Gunite Linings Prolong Concrete Usefulness

922 Gunite concrete cement gun work for lining new and old reservoirs is described in the catalog issued by the Gunite Concrete and Construction Co., 1301 Woodswether Rd., Kansas City 6, Mo. Gunite is also employed for sewer lining and repairing, concrete and masonry repairs, and lining canals, ditches, and drains.

Refuse Incineration

923 The Nichols Monohearth mechanically stoked refuse incinerator provides for more thorough burning and nuisance-free operation, as well as decreased labor costs. The Nichols Engrg. & Research Corp., 70 Pine St., New York 5, N. Y., will supply information on its successful installations in various cities.

Rock Salt Storage At Low Cost

924 *How to Provide Low-Cost Rock Salt Storage* is the title of a pamphlet published by the International Salt Co., Inc., Scranton, Pa.. The booklet describes and presents drawings of various types of economical storage facilities.

Melt Jointing Material Faster For Water-Main Work

925 The Insto-Gas floor-type furnace for waterworks construction has a melting speed of 40 pounds in 6 minutes. It can be employed for melting lead or other jointing materials. The Insto-Gas furnace is available in the handy floor-type style for operation ditches, under buildings, and at places that are difficult to reach. The Insto-Gas Corp., Detroit 7, Mich., will send full details on request.

Get Your Police Motorcycle Manual

926 Of all automotive vehicles, the motorcycle is the smallest, fastest, and most impressive to law breakers. Learn where it is particularly effective, in what types it is available, what its improvement and present specifications are, and see pictures of the police fleets of 10 cities. All are presented in a 16-page *Police Motorcycle Manual* available from the Harley-Davidson Motor Co., Milwaukee 1, Wis.

Air Compressors

927 Wherever compressed air can be used advantageously, whether in aeration for water and sewage plants, starting air for diesel engines, or for general use around a city maintenance shop, the Quincy Compressor Co. would like to fill your requirements. The company's compressors range from 1 to 90 cfm. Learn about them from a new catalog which can be obtained from the Quincy Compressor Co., Quincy, Ill.

Mobile Radio-Telephone

928 The Kaar Engrg. Co. of Palo Alto, Calif., will send information on its Radiopak for use by police, fire equipment, taxi, and trucking installations. The device provides lowest battery drain, is simple in design, rugged, and has exceptional voice quality, stability, and sensitivity. Its power output is 10 to 12 watts, and frequency range, 152 to 174 m.c.

Cement Lining Stops Pipe Corrosion

929 Corrosion in pipelines is avoided when using the system of the Centriline Corp., 140 Cedar St., New York 6, N. Y. The manufacturer points out that the thin coating of cement, mechanically applied and troweled by the Centriline process raises the pH of any moisture entrapped within the lining to a non-corrosive level and prohibits corrosion or tuberculation. Write for descriptive literature on lining pipes from 4 to 144 inches in diameter.

Street-Lighting Equipment

930 Wheeler street-lighting equipment includes a line of products for all common sizes of lamps used on either series or mutiple lighting systems. Among those in series fixtures are high-intensity enclosed luminaires with metal heads, and wet process or dry process porcelain series receptacle heads. Multiple fixtures include small multiple canopies with non-slip, adjustable socket supports. Write for Catalog No. 95 which is distributed by the Wheeler Reflector Co., 275 Congress St., Boston 10, Mass.

Better Rest and Toilet Rooms

931 Available on request is a copy of the *American-Standard Better Rest Room Guide* which may be obtained by writing to the American Radiator and Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Pa. It contains suggestions for cutting maintenance costs and time, as well as a detailed description of the Sanistand fixture, a new woman's urinal for toilet rooms.

Earth-Moving Equipment

932 Hydraulic and cable-controlled earth-moving equipment of The Baker Mfg. Co., Springfield, Ill., to match Allis-Chalmers crawler tractors, is reported in the *Baker Bulletin No. 895*, which has just been released. Described are Baker attachments designed to work A-C tractors. These include the engine-mounted hydraulic control bulldozers, grade builders, and root rippers for the HD-5, HD-9, HD-15, and HD-20, and the three cable control units for the HD-9, HD-15, and HD-20.

Hoists for Dump Trucks

933 You get guaranteed good performance from dump trucks and refuse trucks when you use low-mount hoists made by The Marion Metal Products Co., Marion, Ohio. Illustrated literature states that smooth-working, trouble-free hoist operation is assured by features which Marion engineers have incorporated into these hoists. They can be employed for use under garbage, trash, and rubbish pick-up bodies, and give mounting heights from 6½ to 8½ inches, depending on the type.

Concrete Saws Cut Straight, Smooth Edges

934 Clipper concrete saws cut straight, smooth edges, eliminate radial cracks, and stop spalling. The equipment saws up to 12 feet per minute, one-inch deep in limestone aggregate concrete. Write to the Clipper Mfg. Co., Concrete Saw Division, 2813 S. Warwick, Kansas City 8, Mo., for free literature and prices on the new Clipper saws.

Two-Inch Pump Is Self-Priming

935 The Pelican is a two-inch automatic self-priming pump that has a suction lift up to 25 feet at sea level. Produced by The Gorman-Rupp Co., Mansfield, Ohio, it is non-clogging, portable, and simple to operate. Write for Bulletin No. 7-LW-13 which describes the product as well as other Gorman-Rupp lightweight pumps.

Small Gasoline Engines

936 Briggs & Stratton 4-cycle gasoline engines are employed by municipalities on portable equipment used by maintenance forces, such as small pumps, mowers, compressors, and others. They feature single-cylinder, air-cooled engines. For further details, write to the Briggs & Stratton Corp., Milwaukee 1, Wis.

Concrete for Every Traffic Need

937 *Concrete for Every Trafic Need* is the title of a booklet published by the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill. Photographs illustrate the usage of low-annual cost concrete as the natural choice for widening, two-lanes, national defense use, multiple lanes, and for speed with safety.

Flame-Resistant Canvas

938 Flamefoil canvas gives added protection for canopies, awnings, and tents, is recognized by fire-prevention authorities, and approved by Underwriters' Laboratories, Inc., and municipal and state governments. Details on this fabric, which also resists water, weather, and mildew, may be obtained from Philadelphia Textile Finishers, Inc., Norristown, Pa.

Simplicity of Design In Water Meters

939 American meters for water-works usage feature simplicity of design and give efficient service. Gear trains are interchangeable. Write for informative catalog from the Buffalo Meter Co., 2902 Main St., Buffalo 14, N. Y.

Quick Cleaning of Catch-Basins

940 The Netco catch-basin cleaner averages 20 to 30 basins a day and can be operated continuously. Easily mounted on any short-wheel base truck with 8 feet in back of the cab, the machine's pneumatic controls make it simple to operate. It easily removes all bottles, wire, sticks, stones, and other debris through openings as small as 16 inches. Further information will be supplied by the Netco Division, Clark-Wilcox Co., 118 Western Ave., Boston 34, Mass.

For Ice Control, Use Cinder Spreader

941 The Anthony Co., Dept AC100, of Streator, Ill., manufactures a Super-Speed cinder spreader engineered and developed especially for ice control, chip and seal coating, and dust control. This rugged, heavy-duty spreader gives continuous spot, or intermittent spreading of cinders, sand, or calcium chloride. Twin "tiltable" spinners with deflectors spread uniformly right or left or both sides and ahead of rear wheels for traction.

Salt-Corrosion Problems

942 The addition of Banox, manufactured by Calgon, Inc., Hagan Bldg., Pittsburgh 30, Pa., to the salt neutralizes the corrosive effects of road slush and brine. The company reports that its product reduces the rusting of automobiles, municipal equipment, and steel structures. Write for explanatory printed matter.

(See Page 28 for More Literature)

Obtain this Literature Free of Charge!

Write directly to the manufacturers, or use the coupon on page 25

Rubber Traffic Signs

943 Rubber traffic signs for day or night usage may be obtained from The Sure-Stop Traffic Sign Co., 1604 Grand Ave., Kansas City 8, Mo. They are simple to install and easy to refill. The Sure-Stop signs are made of live, strong, durable, auto tire rubber, and withstand the heaviest traffic, and the most severe weather conditions. They can be run over at any angle and flip back to their normal upright position again.

Pipe Puller and Pusher Makes Service Installation Easy

944 The Trojan pipe puller and pusher cuts costs and saves time, according to The Trojan Mfg. Co., 1112 Race Drive, Troy, Ohio. The device simplifies installation or renewing water and gas service lines under pavement. Model A is used for ½ to 1-inch pipe and weighs 65 pounds. Model B will push up to 2-inch pipe and weighs 140 pounds.

For Street Repairs

945 Bulletin 87, issued by the Connery Construction Co., 4000 N. Second St., Philadelphia 40, Pa., describes the company's Style W heating kettle made in 75, 110, 165, and 210 gallons. It provides fast heating of tar and asphalt for road, street, and airport runway repairs.

Install Cut-in Valve and Sleeve with Few Tools

946 The new Smith cut-in valve and sleeve requires for installation only a ratchet and open wrench, three rubber gaskets, three cast iron follower rings, and a handful of bolts and nuts. The A. P. Smith Mfg. Co., East Orange, N. J., states that its product eliminates large, costly excavations, melting furnaces, pouring pots, and pouring and caulking lead joints. For complete details, write for Bulletin No. MJ2.

Emergency Lighting

947 "Light—when and where you need it" is the statement of the Carpenter Mfg. Co., of Somerville, Mass., in issuing its current *Master-Light Catalog*. Equipment for emergency lighting includes portable flood and searchlights, colored warning lights, and automatic standby lights. The Type F-S dry-battery Portalite has a mile range, and is employed for general emergency, police, fire, and civilian requirements.

Bigger Loads of Garbage and Refuse

948 Larger loads are provided by the Pak-Mor refuse collection units, reports the Pak-Mor Mfg. Co., Loop 13 and Roosevelt Ave., P. O. Box 6147, San Antonio, Texas. Available in 9, 12, and 15-yard capacities, they have all-enclosed cylinders to prevent loose papers and trash from blowing out, and they unload at any angle. Units can be mounted on speedy, highly maneuverable 1½ and 2-ton trucks.

Four-Cycle Diesel Engines

949 Construction and operation features of the Nordberg four-cycle, one-cylinder, and recently introduced two-cylinder, vertical, mechanical injection, Type 4FS diesel engines are contained in the new bulletin published by the Nordberg Mfg. Co., Milwaukee 7, Wis. The engines are offered as complete, self-contained, ready-to-operate electric generating sets, pumping units, and with clutch or stub-shaft power take-off for direct connection or belt drive. Write for *Bulletin 183*.

Catch-Basin Cleaning Problems?

950 If so, Rootes Motors, Inc., 27-11 Bridge Plaza North, Long Island City 1, N. Y., will be glad to furnish information on its catch-basin equipment. Karrier catch-basin cleaners have a short-wheel base for maneuverability, small turning circle, quiet and slow-running vacuum pump, and a subdivided tank with compartments for water and sludge. Dirty water can be returned to the sewer or used for flushing the next catch-basin.

Filter Sand, Gravel

951 The Northern Gravel Co., P. O. Box No. 307, Muscatine, Iowa, reports that many of the larger filter plants throughout the country are using its products. The company's filter sand and gravel are produced from an inland pit so that it is free from river contamination and foreign matter. Municipalities may order the quantities to be shipped in bulk or bagged.

Drains Hydrants In 60 Seconds

952 By push-button control, you can now drain hydrants in 60 seconds with a battery-driven piston-type air compressor, reports the Jet Drain Engrg. Co., 215 N. Fayette St., Saginaw, Mich., in literature describing its Model No. 127 hydrant jet drain. The equipment starts instantly and eliminates balky gas engines. It operates directly from present service car, truck, or tractor battery, and is easily installed in 30 minutes.

Street-Lighting Equipment

953 The Apparatus Dept. of the General Electric Co., Schenectady 5, N. Y., states that its street-lighting equipment has the flexibility to give comfortable visibility engineered to meet the specific needs of each community. Municipal officials wishing to modernize street lighting quickly on an economically sound, planned basis, can secure free service on planning such improvements in their street lighting.

Centrifugal Blowers And Compressors

954 Comprehensive data on three types of De Laval centrifugal blowers and compressors is given in the new bulletin, *No. 0500*, released by the De Laval Steam Turbine Co., Trenton 2, N. J. Multistage; single stage, end suction; and single stage, double suction are the three types of the manufacturer's products. Capacities range from 1,000 to 150,000 cfm for pressures to 150 psi and above.

Fire Apparatus

955 Fire apparatus built by the Fire Apparatus Division of the Yankee Motor Bodies Corp., 1224 E. Olympic Boulevard, Los Angeles 21, Calif., is illustrated in a pamphlet prepared by the manufacturer. Described are the Seagrave-Yankee "Clipper," a triple combination pumping engine with a 500- or 600-gpm Seagrave all-bronze centrifugal pump, and the "Westerner," suited for rural and suburban fire districts and departments.

Painting Guide for Water and Sewage Works

956 On direct request to the manufacturer, the Inertol Co., Inc., 480 Frelinghuysen Ave., Newark 5, N. J., a copy of *Painting Guide for Water Works and Sewage Plants* will be sent to you. The company reports that this publication is especially for the use of consulting engineers to aid them in specifying the most suitable type of coating for every surface, as well as for helping plant superintendents figure requirements.

Stabilize Gravel Streets

957 Who can be sued for an automobile accident caused by loose gravel? This and other subjects concerning unstabilized gravel streets are discussed in a new 8-page bulletin issued by Seaman Motors, Inc., 305 N. 25th St., Milwaukee 3, Wis. The booklet also treats the cost of stabilization versus the savings possible in lower maintenance and in the elimination of gravel losses. *Stabilize Gravel Roads* will be sent to you upon request.

Store Salt Now For a Safer Winter

958 The International Salt Co., Inc., Scranton 3, Pa., advises municipal officials to order Sterling auger-action rock salt now for a safer winter. The company states that its product provides "bare" pavements at less cost and in less time than other methods. Each coarse rock salt crystal bores through ice and snow down to the pavement. The salt is available in carloads, bulk, or 100-pound bags.

Sewage Pumps

959 Pumps for handling storm water and sewage are manufactured by Morris Machine Works, Baldwinsville, N. Y. According to the company, features of its equipment are its in-built quality and exceptional performance, uninterrupted service, and lower operating and maintenance costs. Write for illustrated printed matter.

Handles Water-Works and Municipal Accounting Jobs

960 The Burroughs Sensimatic was designed with the needs of water-works accounting in mind. It is built around the principle of the control panel or "mechanical brain" that directs the machine automatically through any four accounting applications, in any combination. According to the Burroughs Adding Machine Co., Detroit 32, Mich., the Sensimatic provides faster billing and posting, increases output, and reduces accounting costs.

Cast Iron Pressure Pipe

961 A new catalog on its cast iron pressure pipe is issued by the Lone Star Steel Co., P. O. Box 8067, Dallas, Texas. This explains that cast iron effectively resists rust and is the one ferrous metal for water and gas mains and for sewer construction, that will not disintegrate from corrosion. The 2-inch cast iron pressure pipe has a full 2-inch inside diameter and is sand cast in 5-foot laying lengths.

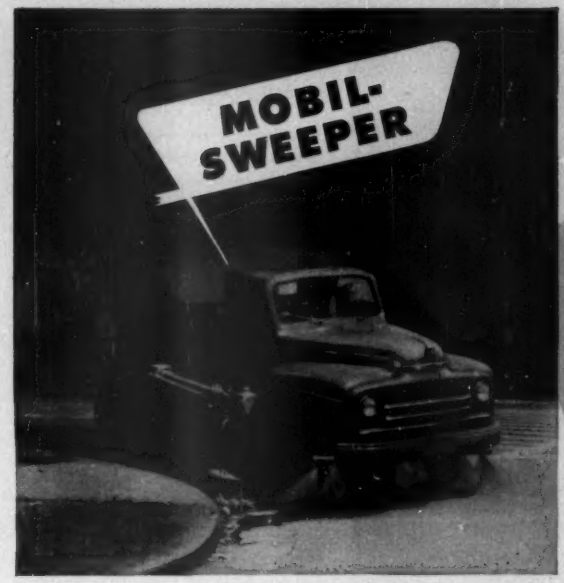
City Planning Based On Aerial Surveys

962 Aerial photographs and topographic maps form the basic source of data for the solution of planning problems in an increasing number of municipalities. The Aero Service Corp., Philadelphia 20, Pa., will supply data on this service and refer you to cities now taking advantage of the work. According to the company, detailed aerial topographic maps can be produced at a fraction of the time and cost of ground surveys. Write for full details.

Restoring Sewers

963 Save the cost of replacing sewers by the "Rebore" method, developed by the National Power Rodding Corp., 4600 W. Madison St., Chicago 44, Ill. The manufacturer's literature points out that its method speedily restores pipes to full capacity, as well as conduits and ducts underground or above ground. This process, which rebores 1,000 feet of pipe in one operation, is recommended for sewer pipes of municipalities, golf courses, and institutions, and for conduits and ducts of public service companies, and drainage waste systems of plants.

(Please Turn to Page 30 for More Literature)



EVERY FEATURE FOR LOW COST SWEEPING

You'll say—*"Mobil-Sweeper is best,"* when you see how easily it tackles tough street sweeping assignments like deep and wide gutters—sharp curb returns—steep hills—under low-hanging trees or protrusions . . . *plus* unexcelled performance on level terrain.

COSTS LESS TO SWEEP—The Mobil-Sweeper cleans more pavement with fewer stops—because the big 2⅔ cu. yd. dirt hopper is filled to utmost capacity every time by the efficient non-clog conveying elevator. Whether your community uses the central dumping system or drives direct to the dump with each load, Mobil-Sweeper's large capacity saves money. Deadheading from city dump or service yard to sweeping area takes less time because only Mobil-Sweeper can travel at maximum traffic speeds up to 55 m.p.h., when not sweeping. Where direct trips to the dump are feasible, Mobil-Sweeper saves the expense of a follow-up truck and crew.

SWEEPS CLEANER—With the big, full-floating pickup broom and right and left gutter brooms you can sweep a 10 ft. swath . . . with pickup broom and one gutter broom a 7'3" swath. Our especially designed gutter broom whisks refuse from even the deepest gutters with a thoroughness that assures cleaner streets.

SAFEST SWEEPER TO OPERATE—Drivers are protected by a steel-top cab and shatter-proof windshields (standard equipment). Self-equalizing 4-wheel hydraulic brakes provide greater safety. And on steep hills or rough pavement you can't beat 4-wheel stability. These and many more features make Mobil-Sweeper your best buy. Write for details on

CLEANER STREETS AT LOWER COST

MOBIL-SWEEPER
DIVISION OF
THE CONVEYOR CO
3260 E SLAUSON AVENUE
LOS ANGELES 58 CALIF

CONVEYCO

THE CONVEYOR CO.
3260 E. Slauson Avenue, Los Angeles 58, Calif.
AC-2
Gentlemen:
Please send catalog with complete details and specifications for the Mobil-Sweeper.

Name_____ Title_____

Address_____ City_____

County_____ State_____

"IDEAL for sewer connections" ... says E. A. Moore Excavating Co.

76% faster than competitive back-hoe!

E. A. Moore Excavating Co., Denver, Colorado, who formerly owned 3 competitive back hoes has finally switched to Bantams® — and with good reasons!

On recent sewer trenching job for *Mountain Plumbing Co.*, in Denver's new Val Verde subdivision, Moore's fast-moving Bantam *completed a total of 826' of 5' trench in 8½ hrs. — compared with only 468' in 9 hrs. for competitive rig under same job conditions.*

Leaves neat, clean trench

Despite heavy clay and gumbo soil, Bantam averaged *three* 65' x 5' house connections from 10 A.M. to 12 noon . . . leaving neat vertical side walls and level trench bottoms that needed no hand trimming. *R. E. Brawley*, 15-year veteran sewer layer, commented: "Bantam is one of the finest rigs to dig a trench for me."

Owner Ed Moore says . . .

"I find my Bantam a very economical machine. It really does the job . . . is easy to operate . . . and is very sturdy and efficient. Maintenance has been practically nil." In fact, Moore was so pleased with results achieved by his *first* Bantam purchased in October, 1950 that he bought his *second* machine in March, 1951.

You can save with Bantams

Whether your problem is digging, lifting or materials handling, you'll be money ahead with a truck-mounted Bantam. Costs less than half the price of bigger rigs . . . goes anywhere fast . . . gets more jobs done at less cost per job. See your Bantam Distributor or write: Schield Bantam Co., 234 Park Street, Waverly, Iowa.

SB-C-15

SCHIELD BANTAM

Costs less . . . travels 35 m. p. h.

GETS MORE JOBS DONE

More Literature

Write directly to the manufacturers, or use coupon on page 25

Equipment for Applying Water-Works Chemicals

964 Water-works chemicals, such as alum and chlorinating compounds, to say nothing of sulfuric acid and copperas, must be applied by equipment designed specifically to handle particular corrosives. A line of such equipment is described in Catalog M available from The Duriron Co., Inc., Dayton 1, Ohio.

Obtain Cleaner Streets At Lower Cost

965 The use of the Mobil-Sweeper means cleaner streets at lower cost, according to the Mobil-Sweeper Division of The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif. Budget-conscious municipalities save on costs with this machine which sweeps more pavement per hour, can perform anywhere a light truck can go, and is designed and built along simplified lines for efficient operation and easy maintenance.

Pipe Detectors

966 Folder 9-R of The Detectron Co., 5637 Cahuenga Boulevard, N. Hollywood, Calif., reports on Detectron Model 505 pipe detectors, which locate, trace, and center pipes and cables with speed and accuracy. Heavy-duty performance is given by the small, compact and lightweight equipment which has a metal case, "sure grip" handle, and shielded loops.

Rotary Snow Plow Has Three Shifts

967 The Trio Snow Jet has three shifts, forward, neutral, and reverse. With its 37-inch, never-clog caterpillar track and 7.7-hp engine, it will move through any snow at the desired throttle speed. This rugged, powerful, 30-inch double rotary snow plow cuts a 30-inch swath; it has two specially designed 9-inch parallel augers which bite into drifts with ease, and its 6-foot blower spout is easily swiveled to blow the snow in any desired direction. Descriptive literature may be obtained from the Dahlman Equipment Sales Co., 500 North Prior Ave., St. Paul 4, Minn.

Traffic Line Marker

968 Kelly-Creswell machines for marking traffic lines have Air Curtain guide plates which make clean-cut, attractive lines without coming in contact with the surface. Other features include air-actuated traction and pressure-cleaning equipment, and special striping guns by DeVilbiss. For further information, write to the Kelly-Creswell Co., Xenia, Ohio.

Glass Covers for Sewage-Treatment Plants

969 Lord & Burnham, Division of Burnham Corp., Irvington, N. Y., and Des Plaines, Ill., on request will furnish its engineers' service sheets, *Sludge Bed Glass Enclosures 142-C*, on glass covers for sewage-treatment plants, sludge beds, sprinkling filters, tanks, or wherever a glass cover is needed. The material contains details, specifications, and recommendations to suit individual job requirements.

Well Water Systems

970 Fifty-two pages of illustrated details on the Layne method of building well water systems will be furnished by Layne & Bowler, Inc., Memphis 8, Tenn. Included are pictures of installations for cities and towns, factories, pipelines, and petroleum refineries.

(See page 31 for more bulletins)

Catalogs for You

Write directly to the manufacturers, or use coupon on page 25

Ice Control and Seal-Coating Spreader

971 Wausau Model A and Model B trailer-type spreaders provide quick action for ice control and seal coating. They give positive control of thickness, control of width, and control of direction. A differential drives the hopper agitator and spinner disk which prevents skidding and consequent loss of spinning power while turning corners. For descriptive literature, write to the Wausau Iron Works, Wausau, Wis.

Tractor Power

972 Power for many purposes is provided by the Standard Bantam tractor, a small edition of a big tractor, and built by the Standard Mfg. and Sales Co., Lebanon, Ind. This versatile machine mows lawns, cultivates gardens, rakes leaves, and operates power tools. The engine operates through a reducing gear and regular automotive type differential to provide ample power for every use.

This Drinking Fountain Eliminates Contamination

973 Municipalities experiencing the danger of contamination of drinking water through back siphonage in their outdoor drinking fountains will solve the problem by contacting The Murdock Mfg. and Supply Co., Cincinnati 2, Ohio. The manufacturer points out that in its product there is no cross-connection between outside sources of pollution and the supply line. The company also produces hydrants and street washers.

Mechanical-Joint Valves

974 M & H mechanical-joint valves are designed to last longer and entail little or no maintenance cost, reports the M & H Valve and Fittings Co., Anniston, Ala. They are available in sizes from 2 to 30 inches, with all end connections. Common labor can be employed to install M & H mechanical-joint valves into an existing pipeline with mechanical joint cutting-in sleeves.

Fire-Fighting Equipment For Civilian Defense

975 American-Marth Pumps, Inc., Battle Creek, Mich., manufactures fire-fighting equipment for civilian defense. The Barton-American UA-50 front-mounted pump delivers large-capacity hose streams and Barton Super-Fog Booster tanks carrying from 1,000 to 2,000 gallons can be used on the UA-50 equipped truck. Get the company's literature describing this equipment.

Remove Water Impurities Faster

976 Produced by The Permutit Co., the Precipitator is adaptable for water softening, removal of turbidity, color, taste, odor, alkalinity, silica, and fluorides. It operates on the principles of precipitation, absorption, settling, and upward filtration. Capacities range from 1,000 gallons per day to 10,000,000 gallons per day. Obtain a copy of the free bulletin from The Permutit Co., Dept. AC-9, 330 W. 42nd St., New York, N. Y.

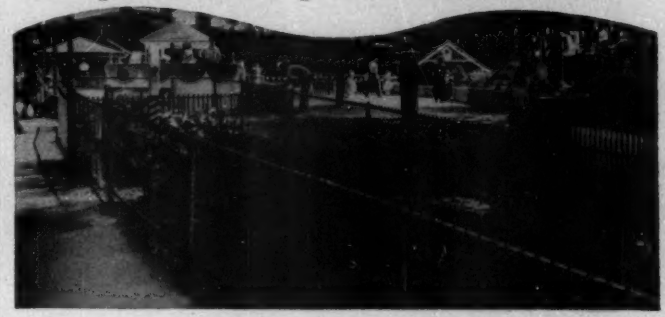
2- to 3-Ton Roller For Street Repairs

977 Littleford's Model 157 portable Trail-O-Roller is a 2 to 3-ton machine designed for rolling patches on street maintenance work, tennis courts, parking lots, driveways, and airport runways, or wherever compaction is needed. Its variation in compaction makes it the utility "work horse" for highway and park departments, cities, and counties. Further information will be supplied by Littleford Bros., Inc., 500 E. Pearl St., Cincinnati 2, Ohio.

(See page 34 for more bulletins)

Children's Zoo in Pittsburgh

...protected by CYCLONE FENCE!



THIS unusual, modern zoo in Pittsburgh, Pa., has been designed to make use of many of the outstanding features of Cyclone Fence. Admissions are easily controlled by high, trespasser-proof fence and gates . . . traffic in the zoo moves smoothly through Cyclone-fenced paths . . . and, where necessary, spectators and animals are separated by additional installations of protection-providing, vision-permitting Cyclone Fence.

Perhaps the municipal project you are considering is far removed from a children's zoo. But whatever the type of project—whether you need simply to define boundaries or control admissions in parks and other recreation areas—or must exclude thieves and marauders from power plants, water supplies and other vital services—there is a type of Cyclone Fence that will meet your needs perfectly. It will be well worth your while to include Cyclone Fence in your original plans. Its many years of trouble-free service will more than repay its original cost—in peace of mind as well as length of service. Why not get in touch with our experienced engineers? They will be happy to give you expert advice on your particular fencing problem . . . without obligation. And, in the meantime, write for a free copy of our catalog which describes all the types of Cyclone Fence.

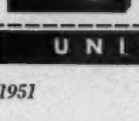
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
WAUKEGAN, ILLINOIS · BRANCHES IN PRINCIPAL CITIES
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NO JOB IS TOO LARGE — NO JOB IS TOO SMALL FOR CYCLONE*

USS **CYCLONE FENCE**

**Cyclone is the trade-mark name of fence made only by Cyclone Fence Division. Accept no substitute.*

— CLIP THIS COUPON — — SEND IT TO —



Cyclone Fence, Waukegan, Ill., Dept. B-101
Please mail me, without obligation, a copy of "Your Fence."

Name.....

Address.....

City.....State.....

I am interested in fencing:
☐ Industrial; ☐ School; ☐ Playground; ☐ Residence.

Approximately .....feet.

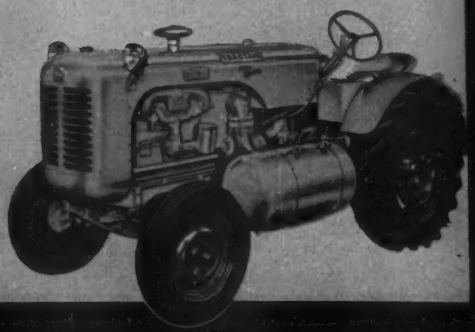
UNITED STATES STEEL

LE ROI

105 Tractair, equipped with backfill blade, air-powering a Le Roi-CLEVELAND 10-lb. Model 31 Clay Digger. You can also use Tractair to run easy-holding Le Roi-CLEVELAND rock drills, hard-hitting pavement breakers, smooth-handling backfill tampers, and the new light wagon drill.

Le Roi gives you more for your MONEY!

more utility
more profits



TRACTAIR

versatility gives you

Digging

Hydraulically-operated Back-Hoe — Bucket sizes 12" to 22". Digging depth 6 to 7 feet. Swing 60° each side of center — a step is provided for cutting straight trench. A stabilizing bar protects Tractair from twisting and digging strains. This tractor-compresser-back-hoe combination offers tremendous savings on digging jobs too small for power shovels, too big to be done economically with hand labor. Besides cutting trench, this unit also ideal for cemetery grave digging.

Pavement Patching

La-Roi CLEVELAND Patcher mounts on the rear platform of a Tractair. It drills closely spaced holes within a 7-foot radius, then breaches the section of pavement loose for easy removal. In this job the bricks were removed first to get to the pavement underneath.

Mud Jacking

Trac-Jac consists of a Le Roi-CLEVELAND air-feed sinker drill mounted on Tractair. Feed and drilling controls are within easy reach of the operator. The mobility of this unit makes it ideal for mud-jacking and many other applications.

Wagon Drilling

Tractair Mobildrill — a compressor and wagon drill in a single, self-contained, self-propelled unit. Universal mounting and swinging boom permit drilling at any angle. Drilling is easier and faster, thanks to Le Roi-CLEVELAND air feed.

Extra Hours of Usage

. . . lets you use economical air power to do more jobs at lower cost

Tractair is a combination tractor and air compressor. Thanks to low center of gravity and good traction, it can go 'most everywhere — doesn't tie up trucks and men for transportation, saves you time and money.

That's why you can put 105 cfm of useful, economical air power to work wherever you need it — use Le Roi-CLEVELAND air tools for breaking pavement, digging, drilling rock, tamping fill, vibrating concrete, driving form pins, and many other tasks.

The money-saving usefulness of Tractair can be multiplied. Just add our front-end loader (with its 8 quickly interchangeable accessories) and you can load, lift, backfill, etc. And Tractair offers you another new attachment, too — a hydraulically controlled back-hoe for digging ditches 12 to 22 inches wide and 6 to 7 feet deep. Air power from Tractair increases the usefulness of the back-hoe by running Le Roi-CLEVELAND breakers whenever it's necessary to break through pavement or frost.

It pays you to investigate Tractair. See your Le Roi distributor — he can show you a unit at work cutting costs with extra hours of usage.

T-18

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

PLANTS: MILWAUKEE • CLEVELAND • GREENWICH, OHIO

Distributors in all these principal cities

ALABAMA: Birmingham, Mobile — ARIZONA: Phoenix — ARKANSAS: Little Rock — CALIFORNIA: Bakersfield, Long Beach, Los Angeles, San Francisco—COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Decatur—IDAHO: Boise, Idaho Falls, Twin Falls, Wallace—ILLINOIS: Chicago —INDIANA: Indianapolis—IOWA: Cedar Rapids, Waterloo—KANSAS: Great Bend, Kansas City, Pratt, Wichita — KENTUCKY: Lexington, Louisville — LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Newton Highlands — MICHIGAN: Detroit, Grand Rapids — MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis — MONTANA: Billings, Great Falls — NEBRASKA: Omaha — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Long Island City, Newburgh, Rochester, Saugerties, Syracuse, Woodside (L.I.) — NORTH CAROLINA: Charlotte — NORTH DAKOTA: Fargo — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo—OKLAHOMA: Oklahoma City, Tulsa—OREGON: Portland — PENNSYLVANIA: Bethlehem, Harrisburg, Philadelphia, Pittsburgh — RHODE ISLAND: Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Dallas, El Paso, Houston, Lubbock, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Milwaukee — WYOMING: Casper

Knowing all this, could you honestly accept anything but

Blackinton Badges?

1. EXPERT DIE WORK

Look closely at the die impression of a Blackinton Badge — see how the characters are clean-cut and sharp. Here is definite proof the die cutting is the work of experts.

2. LONG LASTING MIRROR FINISH

Looking at the finish of a Blackinton Badge is like looking in a mirror. And there is more to the finish than you see on the surface. Blackinton finishes are not just skin deep.

3. SMOOTH HARD ENAMEL

Blackinton Badges decorated with hard enamel have a quality that cannot be matched. Hard enamel fills the recesses flush with the top of the metal, giving a smart looking, permanent finish.

4. PRECISE LETTERING

Look carefully at the lettering of a Blackinton Badge. You can easily see it's the work of experts. Every letter is carefully formed by workers with years of badge experience.

5. CUSTOM DESIGN SERVICE

Blackinton's creative badge designers are prepared to submit sketches of special designs. Why not take advantage of this custom service — Ask your Blackinton badge supplier for the full details.

BLACKINTON

W. H. BLACKINTON & CO., INC., ATTLEBORO FALLS, MASS.

BADGES *for Police, Fire, Town, City, County and State Officials; also Civilian Defense, Plant Protection, and Junior Police.*

Other Catalogs

Write directly to the manufacturers, or use coupon on page 25

Water Filter Surface Washes And Filter Media

978 On request, the Palmer Filter Equipment Co., P. O. Box 1655, Erie, Pa., will send a circular describing its product. Among the advantages of the filter bed agitator are that it eliminates mud balls, requires an average of 40% less wash water, and increases filter runs up to 50%. Anthrafilt advantages are that it requires one-half as much wash water, and that it doubles the length of filter runs attainable with sand and quartz media.

Safety Vault Covers Withstand Heavy Traffic

979 The Wachs safety counterbalanced vault covers are designed and manufactured to withstand the heaviest traffic, reports The E. H. Wachs Co., 1525 N. Dayton St., Chicago 22, Ill. They can be opened with ease and safety by one man, and are used for valve, meter, transformer, and district governor vaults. Write for descriptive literature showing dimensions, weights, construction, and prices.

Water-Control Gates

980 Control gates for water works, sewage disposal, reservoirs, recreation pools, pumping plants, and flood control, are reported in the *Pekrul Gate Catalog No. 49* issued by the Pekrul Gate Division of the Morse Bros. Machinery Co., 2900 Brighton Boulevard, Denver, Colo. Types include sluice, head, or automatic flap; shapes are square, rectangular, or circular, and size, width by height or diameter.

Cleans Sewers From 8 to 30 Inches

981 The Expanding root cutter and sewer cleaner is a machine that can be adjusted in 30 seconds to fit any sewer from 8 to 30 inches. It puts the sewer system in almost 100% clean condition by cleaning the entire sewer wall, top, and sides, and bottom, and by cutting and removing the roots and caked sediment. A new catalog on this equipment is available from the Expanding Sewer Machine Co., 108 E. Walnut St., Nappanee, Ind.

Six Ways to Repair Damaged Pipelines

982 The Dresser Mfg. Division, 59 Fisher Ave., Bradford, Pa., reports that its products for emergency repairs supply six safe, sure ways to repair damaged pipelines quickly. Resilient rubber gaskets provide lasting protection against vibration and shock. The six products include: the bell-joint clamp Style 60; adjustable sleeve, Style 82; split sleeve, Style 57C; coupling, Style 38; bell-pack sleeve, Style 126, and Super-Service fittings, Style 90. Write for illustrated printed matter.

For Chlorine Control

983 W. A. Taylor & Co., 7300 York Road, Baltimore 4, Md., on request will send its new issue of *Modern pH and Chlorine* Control. The manufacturer points out that the booklet supplies service to those interested in pH, chlorine, and phosphate control, and in water analysis. Listed are the most modern and practical equipment, among which are the Model T-O Comparator, Taylor-Enslow Chlorimeter, as well as other comparators and indicators.

Fire Hydrants Easy to Operate

984 Iowa fire hydrants are easy to operate at all times because of the two-piece operating nut with special adjustment screw which solves expansion and contraction problems. Produced by the Iowa Valve Co., 201-299 N. Talman Ave., Chicago 80, Ill., the hydrant's unrestricted water flow gives full pressure at extreme low loss of head.

Operators Agree...

There's NO WINTER LAYOFF for a LULL Shoveloader

EXTRA LIFTING STRENGTH

Lull Shoveloaders are equipped with lifting arms of rugged bridge-like construction. They are designed to give maximum lifting strength without bulkiness and to eliminate twisting or swaying even under maximum loads.

SNOW IS NO PROBLEM . . . for a LULL SHOVELOADER

You'll find Shoveloaders working on city streets, at airports, in the country, and around industrial plants, pushing . . . piling . . . plowing . . . or loading snow with their usual cost cutting efficiency.

Lull Shoveloaders are designed with more weight to the rear of tractor for easier handling and greater traction . . . both mighty important factors in winter operation. Power down crowd instantly controlled by operator permits a quick break through of hardest packed, heavy wet or even deep crusted snow. Ideal for clearing the way for heavy traffic or other operations. These are but a few of many reasons more and more experienced operators agree . . . there's NO WINTER LAYOFF for Lull Shoveloaders.

LONG FORWARD REACH permits Lull Shoveloader to fully load truck bodies from the rear, using only one lane of traffic and eliminating extra time consuming maneuvering.

EIGHT VALUE-PACKED MODELS

Eight models with a wide variety of interchangeable attachments make Lull Shoveloaders the most versatile equipment you can own.

Get LULL SHOVELOADER FACTS today. MAIL THIS COUPON NOW!

LULL Manufacturing Company
3612 East 44th Street, Minneapolis 6, Minn.
Please send illustrated literature on:
LULL SHOVELOADER AND ATTACHMENTS

Name..... Title.....

Company .....

Address .....

City..... State.....

LULL Manufacturing Company
3612 East 44th Street Minneapolis 6, Minn.
Designers and Builders of
The Largest Line of Allied Equipment
for Industrial Wheel Type Tractors

SHOVELOADERS • UNIVERSAL LOADERS • FLUID-DRIVEN SWEEPERS • LULLDOZERS • SHOULDER MAINTAINERS

CUT DIGGING COSTS

with the

new Sherman Power Digger

Patented, actuated bucket gives you selective digging action, better loading, greater versatility.

All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

SPECIFICATIONS

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

Standard tractor mounting gives unmatched maneuverability and transportability.

•

Digs ditches, trenches, footings, culverts, basements and other excavations.

•

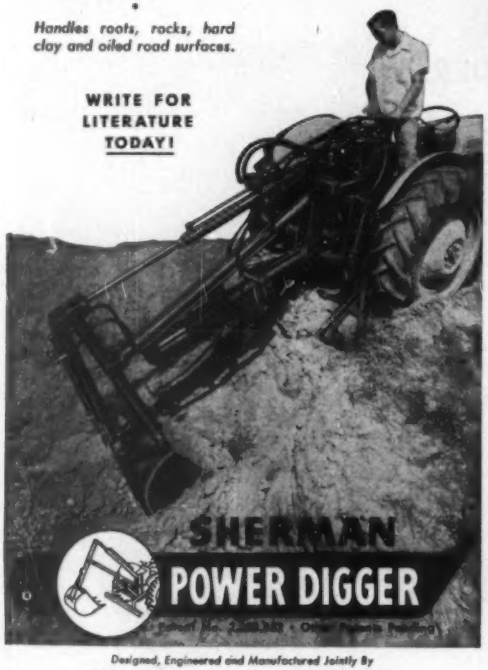
Handles roots, rocks, hard clay and oiled road surfaces.

Works well behind the tractor at any angle.

•

Actuated bucket raises high enough to load standard dump truck.

WRITE FOR LITERATURE TODAY!



Designed, Engineered and Manufactured Jointly By
SHERMAN PRODUCTS, INC. • Royal Oak, Michigan
WAIN-ROY CORP. • Hubbardston, Massachusetts
Sold Exclusively By **SHERMAN PRODUCTS, INC.**

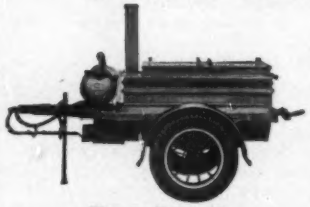
SHERMAN PRODUCTS, INC., Department No. 111 Royal Oak, Mich.

Designing, building and erecting tanks to suit the individual requirements of industries and municipalities has been our business for nearly a century.

Write for latest Cole catalog—"TANK TALK"

R. D. COLE MFG. CO.
NEWNAN, GA. *Established 1854*

Connery's Style W Heating Kettle Made in 75, 110, 165 and 210 Gallons.



For speedy heating of Tar and Asphalt for road, street and airport runway repairs use Connery's style W kettle, the most efficient heating kettle of its kind.

Write for Bulletin 82.

CONNERY CONSTRUCTION CO.
4000 N. Second Street Philadelphia 40, Pa.

M-SCOPE PIPE LOCATOR

Light-Weight MODEL-AB

Only $149.50

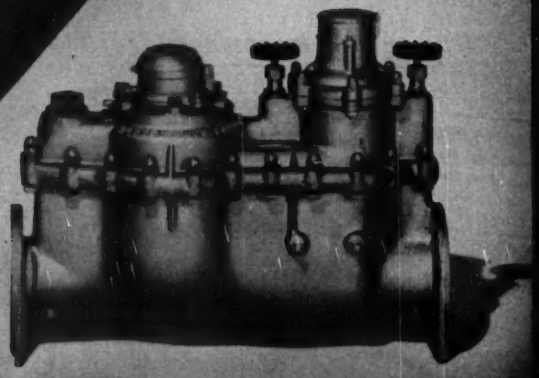
Metal Cased Cabinets
Superior Performance
at Lower Cost

Pipe Finder—Leak Detector Combination Type BL $197.50

Free Illustrated Literature

FISHER RESEARCH LAB., INC.
PALO ALTO CALIF.

HERSEY



When the Lid of a

COMPOUND WATER METER

bears the name HERSEY, experienced water works officials know they are getting a Meter with a reputation for accuracy, long life and low maintenance cost. Remember, only HERSEY makes this exclusively designed Compound Water Meter.

All Bronze Case from 2" to 6"

HERSEY MANUFACTURING COMPANY

SOUTH BOSTON, MASS.

BRANCH OFFICES: NEW YORK — PORTLAND, ORE. — PHILADELPHIA — ATLANTA — DALLAS — CHICAGO
SAN FRANCISCO — LOS ANGELES

95% OF AMERICA'S LARGE CITIES

85% OF AMERICA'S MEDIUM CITIES

70% OF AMERICA'S SMALL CITIES

Use **"FLEXIBLES"** *Exclusively*

Since we started *"getting the men out of the sewer holes"*... eliminating hard digging and unsanitary working conditions 18 years ago..."**FLEXIBLES**" have saved many a man's life and greatly improved both sanitary and sewer pipe protection! You cannot afford to be without "**FLEXIBLES!**"

WRITE FOR FREE DATA

"FLEXIBLE"

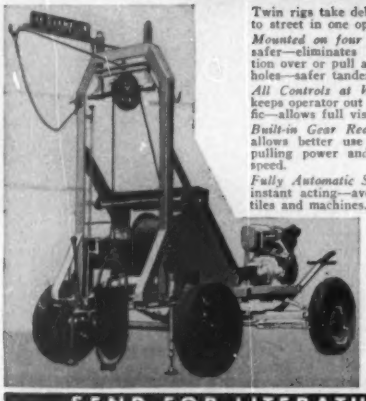
UNDERGROUND PIPE CLEANING CO.
SEWER-ROD EQUIPMENT CO.
9039 VENICE BOULEVARD, LOS ANGELES 34, CALIF.

41 Greenway St. — Hamden 14, Conn.
147 Hillside Terrace — Irvington, N. J.
P. O. Box 465 — Memphis, Tennessee
1115 Delaware Ave. — Fort Pierce, Fla.
141 W. Jackson Blvd. — Chicago, Ill.
200 Magee Bldg. — Pittsburgh, Penn.
66 Kinsey Drive — Rochester 9, N. Y.
29 Cerdan Avenue — Roslindale 31, Mass.
801 E. Excelsior Blvd. — Hopkins, Minn.
3786 Durango St. — Los Angeles 34, Calif.
4455 S. E. 24th Street — Portland, Oregon
Francis Hankin—Montreal & Toronto, Can.
351 West Jefferson Blvd. — Dallas, Texas

AMERICA'S LARGEST MANUFACTURER OF PIPE CLEANING TOOLS & EQUIPMENT

NEW IMPROVEMENTS
Cable Drum Clutch
Upper Arch Sheave
Automatic Cable Level Wind

OK CHAMPION *Power Sewer Cleaner*



Twin rigs take debris from sewer to street in one operation.

Mounted on four wheel trucks—safer—eliminates lifting to position over or pull away from manholes—safer tandem towing.

All Controls at Working End—keeps operator out of passing traffic—allows full vision of work.

Built-in Gear Reduction Ratio—allows better use of engine for pulling power and bucket travel speed.

Fully Automatic Safety Clutch—instant acting—avoids damage to tiles and machines.

CHAMPION CORPORATION
Hammond, Indiana

SEND FOR LITERATURE

Champion Corporation, 4716 Sheffield Ave., Hammond, Indiana
Please send information on new OK Champion Power Sewer Cleaners.

Name.....Title.....

Address.....

POWER FOR TOOLS ...LIGHTS FOR SAFETY!
FAIRBANKS-MORSE GENERATING SETS

Available in capacities from 600 to 35,000 watts.

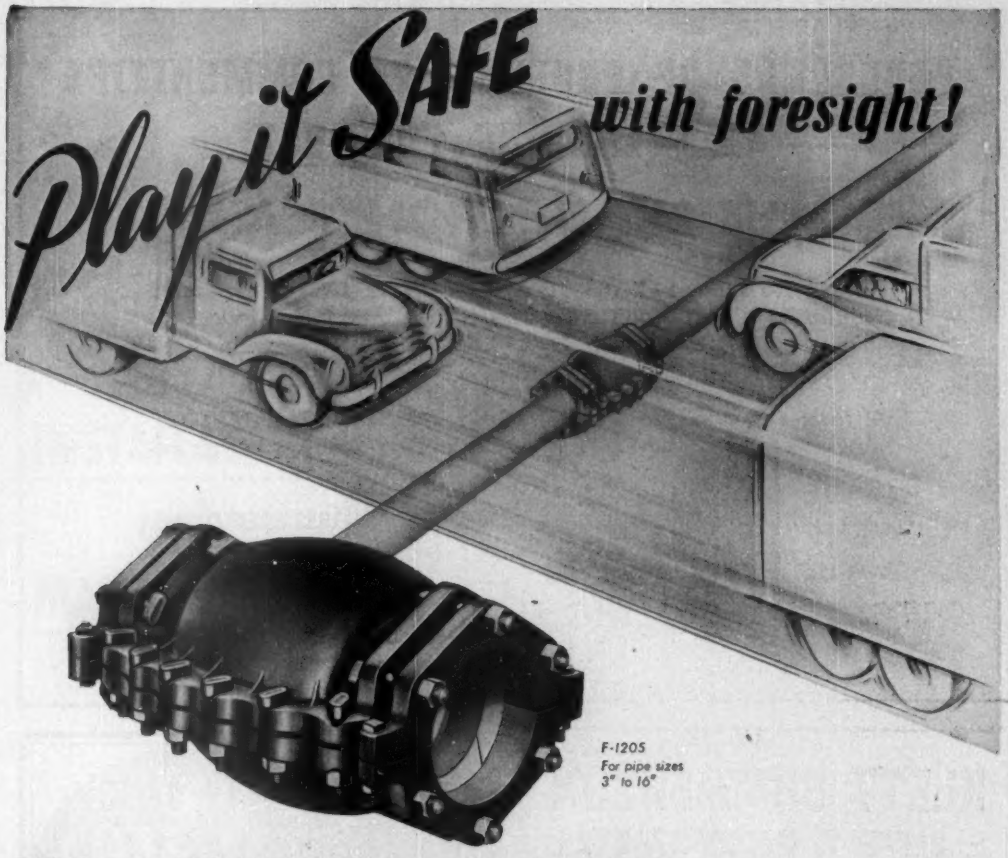
Construction and repair crews working away from high power lines will find a dependable source of electric power in a Fairbanks-Morse Generating Set.

These generators are widely used by railroads, lumber camps, oil field operators, government services, public works contractors and many others, because of their ability to take hard knocks and still deliver power.

Send for booklet describing the complete line of Fairbanks-Morse Generators. Write Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,
a name worth remembering

Play it SAFE with foresight!



F-1205
For pipe sizes
3" to 16"

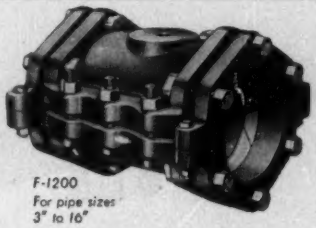
Reinforce all joints subject to vibration with

CLOW

Mechanical Joint BELL SPLIT SLEEVES

When ponderous trucks roar and rumble by, even our finest highways tremble with vibration . . . and so does the water pipe buried below! That's why it's best to play it safe: don't wait for a break; have the foresight to install Clow Mechanical Joint Bell Split Sleeves as *original equipment* wherever the pipe must pass under highway truck routes or under railroad tracks. Specify them for marshland or under water, too—in fact, everywhere that pipe is not readily accessible in case of emergency. They're easy to install . . . no lead, no jute, no caulking!

Write for circular with helpful information and illustrations



F-1200
For pipe sizes
3" to 16"

Use these F-1200 Clow Mechanical Joint Straight Split Sleeves for permanent repairs to pipe barrels. 12" and smaller sizes will repair lengthwise breaks up to 8 inches; 14" and 16" sizes, up to 17 inches.

JAMES B. CLOW & SONS

201-299 North Talman Avenue • Chicago 80, Illinois

and their National Cast Iron Pipe Division, Birmingham, Alabama; subsidiaries Eddy Valve Company, Waterford, N.Y.; Iowa Valve Company, Oskaloosa, Iowa

THOUSANDS OF PROGRESSIVE COMMUNITIES ARE PLANNING FOR 1952

"THE BIG ELECTION YEAR"

Over 5,000 of these CITIES, TOWNS AND VILLAGES are equipped with AUTOMATIC VOTING MACHINES and look forward to SPEEDY, ACCURATE, ECONOMICAL ELECTIONS with CONFIDENCE.

If your community does not use the "MECHANICAL BALLOT," investigate and compare its ADVANTAGES over your present election system.

Now is the time to plan for EASY, SUCCESSFUL 1952 ELECTIONS.

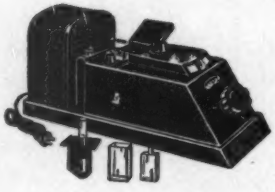
WRITE:

AUTOMATIC VOTING MACHINE CORPORATION

Jamestown, New York

KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined.

KLETT MANUFACTURING CO.
179 East 87th Street New York, N. Y.

WORTHINGTON-GAMON

LIQUID METERS
All Sizes All Types

WORTHINGTON-GAMON METER DIVISION
Worthington Pump and Machinery Corp.
296 South Street Newark 5, New Jersey

Interchangeable Parts

SAVE INSTALLATION and MAINTENANCE TIME

WITH CHAPMAN *Standardized* SLUICE GATES

You'll make faster, easier installations with Chapman's Standard Sluice Gates. Interchangeable stems and couplings assemble quickly in the field — without match-marking.

And you'll save time on maintenance, too. Chapman's interchangeable repair and replacement parts always fit—without struggle or alterations.

Three types of control available—your choice of manual, hydraulic cylinder or motor are designed to give you easy, dependable operation. Learn the full time and money saving facts. Send today for your copy of Chapman's Standard Sluice Gate Handbook.

THE CHAPMAN VALVE MFG. CO.

INDIAN ORCHARD, MASSACHUSETTS

We don't seriously suggest that sponsoring the General Electric Disposall® will actually win you a permanent memorial—but across the country more and more community leaders are earning the sincere thanks of their communities through planning multiple installations of this revolutionary G-E appliance. This electrical marvel shreds food-wastes into tiny particles and then *washes* them away to septic tank or sewer. And public support for the G-E Disposall grows more enthusiastic every day.

What this modern, electrical, more hygienic method of garbage removal has already done for other progressive cities provides striking proof of the economy and effectiveness of municipal G-E Disposall projects of this kind.

In Jasper, Indiana, for instance, installation of G-E Disposalls is already complete in two-thirds of all homes. The city's garbage collection service has been suspended.

In Herrin, Illinois, and Mount Dora, Florida, whole groups of housewives—thanks to the action of local leaders—now get rid of food-wastes the G-E way, simply by turning the kitchen faucet.

If you are in any way concerned with civic planning or sewage treatment, *now* is the time to consider this revolutionary means of making your city a better place to live.

Let us send you this booklet

G-E DISPOSALL

CONVERTS FOOD-WASTE TO SEWAGE—ELIMINATES "GARBAGE"

Trim and specifications subject to change without notice.

Let us send you *"What Was Garbage?"*—a guide to municipal Disposall installations—an authoritative booklet that answers your questions on this great new advance in sanitation. No cost or obligation—just write General Electric Company, Box A10, Bridgeport 2, Connecticut.

You can put your confidence in—

GENERAL ELECTRIC

It Pays Double to Standardize on HOMELITE *Carryable* EQUIPMENT

Homelite Carryable Pumps
for fastest automatic pumping on all types of dewatering jobs

Homelite Carryable Generators
for instant, dependable power, for floodlights or electric tools

Indeed it does! In the first place when you standardize on Homelite Pumps and Generators you give your men the best. Easy to operate, *sure* to operate, they're all powered by the famous Homelite built-in gasoline engine . . . a dependable, weather-proof, dustproof, foolproof engine that assures best performance at all times.

What's more, when you standardize on Homelite equipment you cut your maintenance problems to the minimum. Your nearby Homelite field service branch, completely stocked with standard Homelite parts can keep your units in perfect shape always *and economically.*

Homelite Factory Branches
throughout the country bring service right to your door

Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE CORPORATION

110 RIVERDALE AVENUE • PORT CHESTER, N. Y.

WITH A WILKINSON LINE LOCATOR

You DON'T have to GUESS

WILKINSON LINE LOCATOR

the original light-weight, compact, precision locator — is **POWERFUL.**

It locates every part of your underground pipe system, however deep and shows the depth of lines.

It's FAST, EXACT, SIMPLE.

Avoid expensive damage to subsurface structures by power trenching machines with the Wilkinson Line Locator, the electronic sleuth.

To Spot Your
- MAINS
- SERVICES
- STUBS
- VALVES
- BOXES
- COUPLINGS

QUICK FAST EXACT

QUALITY IS ALWAYS CHEAPER

WILKINSON PRODUCTS CO.
3987 CHEVY CHASE DR.
PASADENA 3, CALIF.

Unit "UTILITY" HOIST
HYDRAULICALLY OPERATED FOR SHOP OR TRUCK
FAST...EASY...SAFE!

NOW . . . reduce material handling time to a minimum with the fast UNIT UTILITY HOIST. One man handles heavy loads where several men were used before. Eliminates serious accidents caused by heavy hand lifting. Reduces labor costs, increases work output per day.

★ FROM SHOP TO TRUCK HOIST in seconds! Simply lift UNIT UTILITY HOIST from 3-wheel frame, place in socket or well mounted on truck bed, work bench, loading dock or machine tool. Hoist swings 360° in well.

Write Dept. C for Complete Details

UNIT HYDRAULIC EQUIPMENT

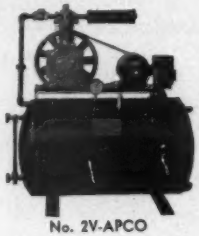
Manufacturers of hydraulic cylinders for original equipment.

UNIT MANUFACTURING CO
1779 HARMON PLACE • MINNEAPOLIS 3, MINNESOTA

No. IV-APCO

APCO-V-APCO PRIMERS
FOR CENTRIFUGAL PUMPS
AUTOMATIC POWER OR TANK PRIMERS
SINGLE OR DUPLEX UNITS
DUAL DRIVE WITH GASOLINE ENGINE
ALL UNITS ENTIRELY AUTOMATIC

AIR RELEASE VALVES
FOR VENTING AIR OR GASES
17 TYPES



No. 2V-APCO

VALVE AND PRIMER CORPORATION 356 WEST HURON ST., CHICAGO 10, ILL.

"GUNITE" CONCRETE (Since 1915)
SPECIALISTS IN CEMENT GUN WORK

RESERVOIR LININGS (NEW AND OLD) • CONCRETE AND MASONRY REPAIRS • STEEL ENCASEMENT • FIREPROOFING • STEEL COAL BUNKER, STACK, HOPPER, AND PLATE LINING • SEWER LINING AND REPAIRING • CANAL, DITCH, AND DRAIN LINING.

GUNITE CONCRETE & CONST. CO.
1301 Woodswether Road Kansas City 6, Missouri

District Branch Offices
S. T. Burton Co., 228 N. LaSalle St., Chicago 1, Ill.
George R. Lewis Co., 2836 Queen Avenue, So., Minneapolis 5, Minn.
R. H. Mueller Co., 6626 Delmar Blvd., St. Louis 5, Mo.
Ole K. Olsen Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard, 2036 Addison, Houston 5, Tex.
Western Steel Prod. Co., 1705 W. 13th Ave., Denver 4, Colo.
See our catalog in Sweet's

SWENSON SIDEWALK SAND SPREADER

A new fast way to cover icy walks with sand, ashes, cinders, salt, etc.

Can be used on road jobs all year 'round.

1-yard hopper

Write for circular.

SWENSON SPREADER & MFG. CO., Lindenwood, Ill.

These are the straight facts... the complete story on "Century" Asbestos-Cement Pressure Pipe

IN hundreds of communities, in nearly every section of the country, "Century" Asbestos-Cement Pressure Pipe is saving taxpayers' dollars by providing trouble-free water main service. Here are the actual facts on "Century" Pipe for your consideration in your own water main requirements.

History of Asbestos-Cement Pipe

For several years prior to 1920, engineers in this country received reports of a revolutionary new kind of pipe that was being widely and successfully used in Europe. It was said to have great durability, and to require none of the costly maintenance that had long been accepted as matter-of-course in the distribution of water throughout a community. This pipe was, of course, Asbestos-Cement Pipe. It was first manufactured experimentally in 1913, and within three years was established on a commercial basis. By 1921, seamless Asbestos-Cement Pipe was generally accepted for many important water mains and other pressure services throughout Europe. In that same year, the manufacturing process was patented in the principal industrial countries of the world. Today, "Century" Asbestos-Cement Pipe is a truly modern pipe—improved by Keasbey & Mattison and made with the help of new technological discoveries and manufacturing methods.

Strong and Durable

In water main service, long pipe life is a primary consideration. The two ingredients of "Century" Pipe—asbestos and portland cement—have been known and used for years for projects that were built to endure. The special Keasbey & Mattison process also contributes to building exceptional strength into "Century" Asbestos-Cement Pipe. And K&M's system of rigid quality control is further assurance of high strength and uniform quality. As a routine manufacturing step, every section of "Century" Pipe is hydrostatically tested in excess of its stated working pressure to insure an ample factor of safety.

Non-Corrosive

Corrosion is an external enemy which first weakens pipe and then ultimately destroys some types of pipe. This means that waterworks are, in many instances, faced with the necessity of replacing part or all of a line. "Century" Asbestos-Cement Pipe, being non-metallic, cannot corrode. Nor is it affected by stray electric currents. Therefore it is also immune to electrolysis—another common type of pipe enemy.

Non-Tuberculating

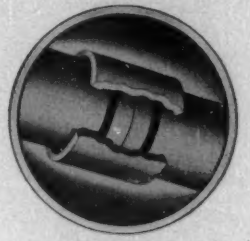
Tuberculation is a pipe enemy from within. It increases friction and progressively reduces flow area. But non-metallic "Century" Asbestos-Cement Pipe cannot tuberculate. The flow area is fully maintained and friction is kept to a minimum . . . insurance against increased pumping cost over the years.

Strong, light-weight "Century" Pipe is easy to handle, easy to lay.

Easy to Handle—Easy to Lay

The comparatively light weight of "Century" Pipe makes handling easier. Generally speaking, when the installation recommendations supplied with the pipe are followed, even with unskilled labor "Century" Asbestos-Cement Pipe can be laid easily, simply, and quickly.

"Century" Simplex Couplings



"Century" Simplex Couplings are installed quickly, easily, even by unskilled labor.

Simplex Couplings are made of the same materials—asbestos and portland cement—as the "Century" Pipe. They give you a combination of immediately and permanently tight joints that are also flexible, providing for up to 5° deflection. Simplex Couplings have only three parts: the asbestos-cement sleeve and two specially compounded round rubber gaskets. Assembly is quick and easy.

High Re-use Value

An important "plus". "Century" Pipe is so strong, durable and resistant to the wear of time, that it can be removed and relaid in its original pressure class at any time, using the same Simplex Couplings from the original installation.

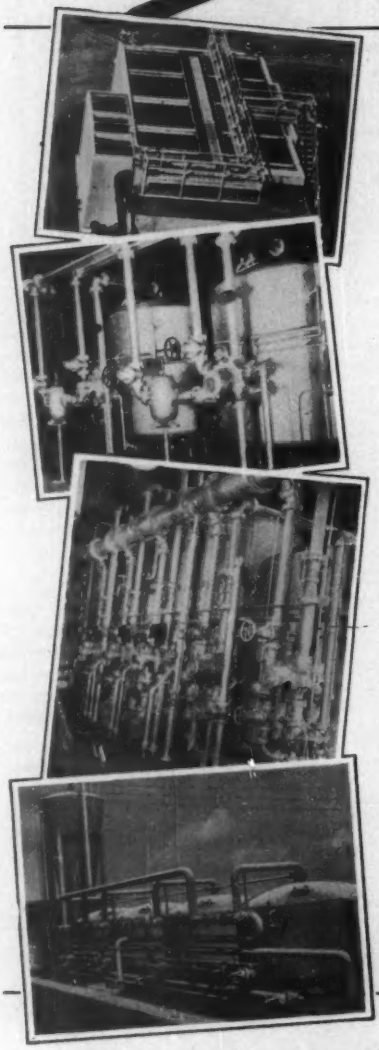
Free Booklet

"Mains Without Maintenance" is a valuable reference book for anyone interested in pipe for water mains. *FREE*—write for it.

Nature made Asbestos...
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

4 means to one end... SOFT, CLEAR MUNICIPAL WATER



1. Precipitation

The Permutit Precipitator softens and purifies water, removing turbidity, color, taste, odor, alkalinity, silica, and fluorides. It works by precipitation, adsorption, settling, and upward filtration. This operation saves you up to 50% in space, 40% in chemicals, and 75% in treatment time.

2. Zeolite

The ion exchange (zeolite) process is the simplest method of softening water. Permutit is the only manufacturer of all types of ion exchangers and equipment.

3. Iron Removal

Processes for iron removal include base exchange; oxidation by manganese zeolites; aeration, settling, and filtration.

4. Cold lime-soda Treatment

The Permutit Spiractor requires far less space and treatment time than older types of lime-soda equipment. In the Spiractor, the precipitates accumulate on solid nuclei to form large, heavy granules which separate from water even at relatively high flow rates. No sludge is formed, and the granules are easily disposed of.

For full information about these or any other water conditioning processes, write, The Permutit Company, Dept. AC-10, 330 West 42nd Street, New York 18, N. Y., or to Permutit Company of Canada, Ltd., 6975 Jeanne Mance Street, Montreal.

PERMUTIT

WATER CONDITIONING HEADQUARTERS FOR OVER 38 YEARS

A million trucks is an impressive number of trucks. It is even more so when you consider this fact: it represents more than half of the Internationals built in the past 44 years.

What proof could be stronger testimony that International Trucks are engineered to give you lower operating and maintenance costs over a longer truck life?

See your nearest International Truck Dealer or Branch for all the facts—join the next million truck users who will have the greatest truck value on the road.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL INTERNATIONAL **TRUCKS**

"Standard of the Highway

GOLDAK'S value plus!
THE
Dualtronic
COMBINATION
PIPE LOCATOR
and
LEAK
DETECTOR
Since first introduced, the "Dualtronic", has met with instant success with Municipalities and Utilities throughout the world, because of the time and labor savings effected by one instrument doing the work of two so efficiently and effectively. Ruggedly built! Lightweight! One man operation! The "Dualtronic", is the answer on how to cut costs 50%!
GOLDAK
FEATHERWEIGHT
MODEL 87
PIPE
LOCATOR
Guesswork eliminated. Pin-point location of pipes, mains, gates, tees, etc. One man operation, total weight 11 lbs! Strong, positive location signal guaranteed by Licensed circuits and Microtuning, exclusive with Goldak. Lasts a lifetime, guaranteed performance. Write for FREE literature!
GOLDAK

FILTER SAND AND GRAVEL

Produced from an inland pit hence free from river contamination and foreign matter.

Shipment in bulk or bagged.

Many of the larger filter plants throughout the United States are equipped with our products.

Prompt Shipment

Inquiries and orders solicited

NORTHERN GRAVEL COMPANY
Muscatine, Iowa
P. O. Box No. 307 **Phone: 193**

The Preferred Hotel in
NEW YORK
CITY

At Times Square.
Walking distance to everything worthwhile.
1400 Rooms, each with private bath, shower.

From **$3.50**

Special rates for servicemen

HOTEL
LINCOLN
44th to 45th Sts. at 8th Av.

FLINT, MICHIGAN, STEPS AHEAD!

Increases Police Efficiency with Additional Harley-Davidsons

Shown above is the new, all-Harley-Davidson mounted traffic squad at Flint, Mich. Left to right: Thomas Haley, Gene Blackman, Vernon Humphry, Charles Raab, Willard Johnson, Leo Edwards, Carl Boyle, Donald Wright, Nelson Burleigh, Donald Thorpe. Standing: left to right: Captain George Ringler, Chief James T. Byars and Dealer Herb N. Johnson.

SPURRED by a marked increase in speeding on city streets and mounting disregard of traffic laws, Flint has enlarged its motorcycle squad to ten. Three late model Harley-Davidson solo machines and seven Servi-Cars are now on full-time duty. Captain Ringler of the Flint Traffic Bureau says, "We're pressing our speed control program and with this motorcycle force we believe we'll be able to combat speeders effectively and cut down the accident rate."

In other communities throughout the nation, traffic violation is also an ever-growing problem. And like Flint, more and more cities are increasing the strength of their motorcycle squads and adding more Harley-Davidsons. Your city can benefit likewise. These big, powerful machines are unequalled for police work. They handle easily, steer effortlessly, hug the road, ride comfortably and help the mounted officer do his duty more quickly and effectively. Ask your dealer for complete information on the 1952 Harley-Davidson Police Motorcycles, Servi-Cars and Sidecars, or write . . .

HARLEY-DAVIDSON MOTOR COMPANY, Milwaukee 1, Wis.

POLICE MOTORCYCLE MANUAL

You'll find many helpful ideas for your traffic department, in this new, illustrated 16-page booklet. It's chock-full of information about police motorcycles and their use in law enforcement and accident prevention work. Your copy will be sent promptly on request. No obligation. Write today.

HARLEY-DAVIDSON

MOTORCYCLES POLICE BETTER TRAFFIC CONTROL **SERVI-CARS**

"90° above or sub-zero, we can rely on our HEIL Dump Units

to meet any emergency of street and highway repairs and maintenance"

—says Louis H. Dillenburg, highway commissioner, Shawano Co. Highway Dept., Shawano, Wisconsin.

★ Heil reinforced body can't sag!

★ Heil hoist and pump assure fast dumping!

★ Heil design saves weight — permits bigger loads!

Many an official agrees that Heil Bodies and Hoists pay out in public service. Fifty years of experience equip Heil to build dump units that stay on the job with less maintenance and repair expense.

There's a Heil unit that meets *your* requirements. Heil hoists fit any truck chassis. Hoisting capacities range from 8,000 to 90,000 pounds. Heil bodies are available in all popular sizes.

Specify *Heil* on your next bid for equipment. Write for latest bulletins.

THE HEIL CO.
DEPT. 4310I, 3043 WEST MONTANA STREET
MILWAUKEE 1, WISCONSIN
Factories: Milwaukee — Hillside, N. J.
District Offices: Hillside, Washington, D. C., Atlanta, Milwaukee, Detroit, Chicago, Kansas City, Dallas, Los Angeles, Seattle

BH-174

Heilliner 2-wheel Tractor and Scraper

Heil Scrapers

Heil Dozers

Heil Platform Conversion Hoist

HK

SELF DUMPING TRI-TRALOR

No hoist, hydraulic, or P.T.O. system to bother with.

Easiest maneuvering— mounts any farm box.

EFFORTLESS DUMPING IN 1/10th THE TIME ANYPLACE

HOTCHKISS STEEL PRODUCTS CO.
Dept. 35A, Bradford, Ill.

CUT *YOUR* SWEEPING COSTS *75%*
with
Wilshire POWER SWEEPER

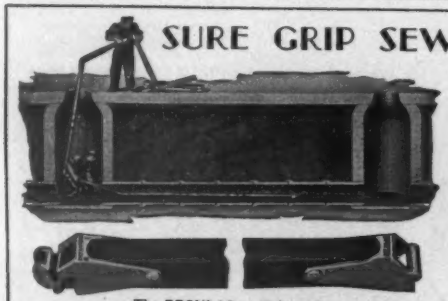
Picks up everything from cigarette butts to pop bottles in one easy operation! Write today for dealer nearest you and **FREE on-Your-Job DEMONSTRATION.**

For dealer nearest you, write Dept C-10.

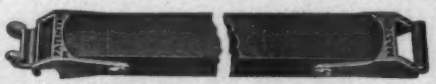
Wilshire
POWER SWEEPER CO.
526 W. Chevy Chase Drive
Glendale 4, Calif.

Sweeping the Country since 1940!

SURE GRIP SEWER RODS and ACCESSORIES



are joined together with a dual lock forming a rigid chain that will float. They can be coupled or uncoupled upon the street if desired. Made in two sizes.



The MASTER, a heavy duty rod. Fir stock 1½ x 1½ inch square.

Write for catalog on complete line of sewer cleaning equipment.

The REGULAR, a light rod. Fir stock 1¼ x 1¼ inch square.

EXPANDING SEWER MACHINE CO.
NAPPANEE, IND.

THERE'S A WAY TO STOP GRADE CROSSING ACCIDENTS!

Hundreds of communities have solved the problem — made their crossings safe 24 hours a day with

Model 10

AUTOMATICALLY OPERATED HIGHWAY-RAILROAD GRADE CROSSING SIGNALS

Yes, thousands of crossings have been made safe, and thousands of lives spared, because local officials and civic groups co-operated with the railroads in a concerted effort to eliminate grade crossing accidents.

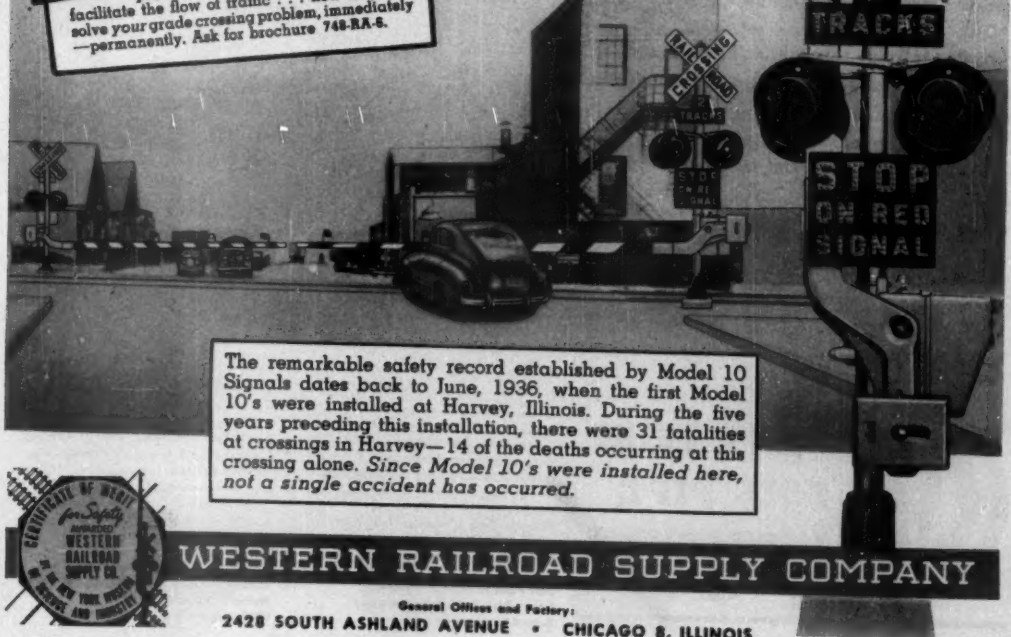
Model 10 Signals end the crossing menace...

QUICKLY: Model 10 installations entail no major construction work, no time-consuming legislative action, as are necessary when overhead or underpass separations are built.

EFFECTIVELY: Model 10's operate unfailingly — automatically, in all kinds of weather. Not a single accident has ever occurred as a result of operative failure on the part of these signals.

ECONOMICALLY: Model 10's can be installed for a fraction of the cost of overhead or underpass construction, an important consideration to communities contributing financially to highway-railroad safety programs.

Write for free copy of "Grade Crossing Safety is Your Business." Learn why Model 10's have been chosen to guard the busiest crossings on a hundred railroads . . . how they prevent "second train" accidents . . . facilitate the flow of traffic . . . how they can solve your grade crossing problem, immediately —permanently. Ask for brochure 748-RA-8.



The remarkable safety record established by Model 10 Signals dates back to June, 1936, when the first Model 10's were installed at Harvey, Illinois. During the five years preceding this installation, there were 31 fatalities at crossings in Harvey—14 of the deaths occurring at this crossing alone. *Since Model 10's were installed here, not a single accident has occurred.*

CERTIFICATE OF MERIT for Safety AWARDED TO WESTERN RAILROAD SUPPLY CO.

WESTERN RAILROAD SUPPLY COMPANY

General Offices and Factory:
2428 SOUTH ASHLAND AVENUE • CHICAGO 8, ILLINOIS

What is the one material that gives permanent protection

Only **cast iron soil pipe** — and fittings — can give you *permanent* protection against ground water pollution and escaping sewer gas. The structural strength of **cast iron soil pipe**, plus its absolute dependability of joints, is your safeguard against fracture or leaks from normal ground settlement or root infection.

Cast iron soil pipe has withstood the test of time, by generations of use in plumbing applications — has proved in countless instances that it has less limitations than any other material.

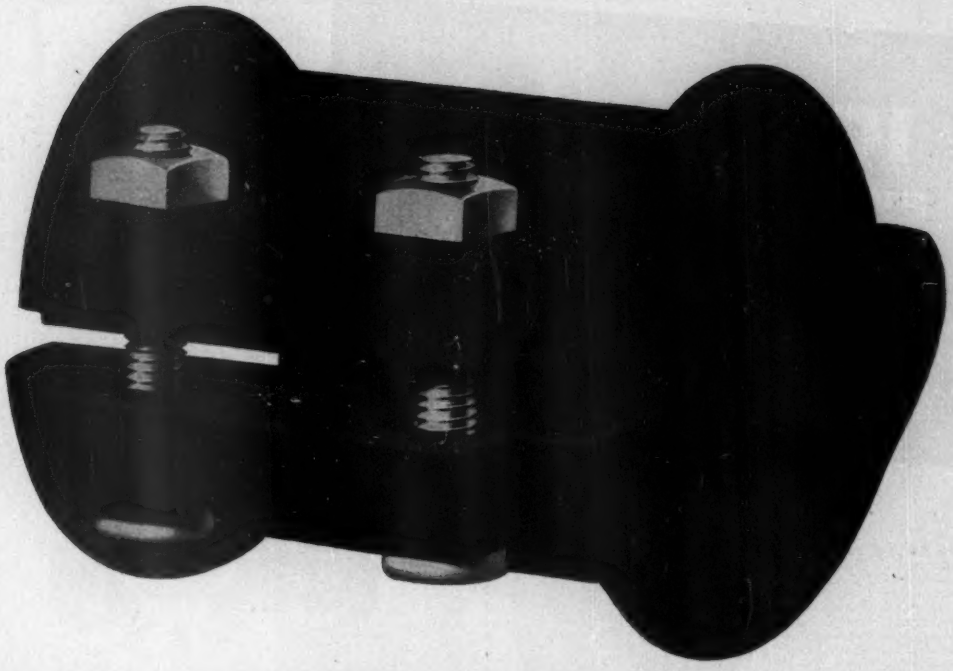
This *proven permanence* of **cast iron soil pipe** — and fittings — is the reason why *your* community, and every community in the country has included in its code, **cast iron soil pipe** — and fittings.

CAST IRON SOIL PIPE INSTITUTE
Heurich Building, 1627 K. St., N.W., Washington 6, D. C.

CAST IRON SOIL PIPE INSTITUTE

This advertisement is sponsored by

Alabama Pipe Company
The American Brass & Iron Foundry
Anniston Foundry Company
Anniston Soil Pipe Company
Attalla Pipe & Foundry Company, Inc.
Buffalo Pipe & Foundry Corporation
The Central Foundry Company
Charlotte Pipe & Foundry Company
Combustion Engineering—Superheater, Inc.
Crown Pipe & Foundry, Inc.
The Eastern Foundry Company
East Penn Foundry Company
Emory Pipe & Foundry Company
Hajoca Corporation
Herco Foundry, Inc.
T. C. King Pipe & Foundry Company
Pacific Cast Iron Pipe & Fitting Company
Peerless Pipe & Foundry Company, Inc.
Reading Foundry Company
Rich Manufacturing Company of California
Rudisill Foundry Company
Sanitary Company of America
Somerville Iron Works
Tyler Pipe & Foundry Company
Walker Machine & Foundry Corporation
Western Foundry Company
Williamstown Foundry Corporation



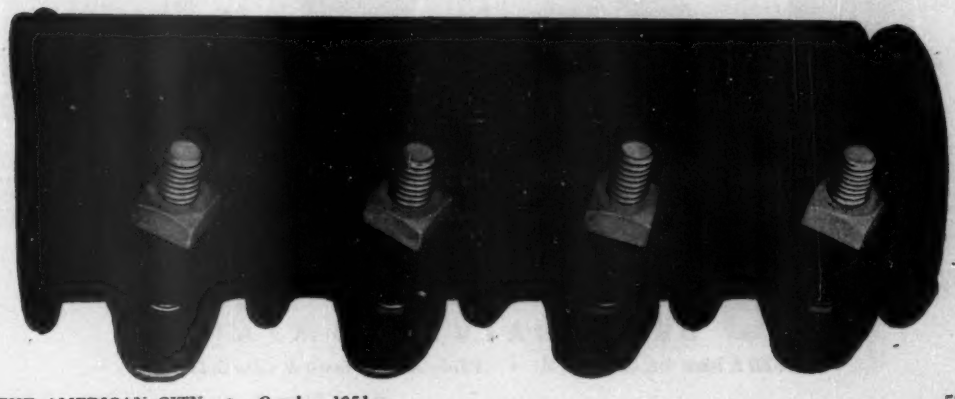
EMERGENCY PIPE CLAMP

SKINNER-SEAL

PIPE LINE CLAMP

During the present critical shortage of pipe, nothing compares with* these clamps for repairing corrosion leaks and splits in services as well as mains—for all sizes of steel and cast iron pipe, ½" to 12". Standard of the industry for half a century.

M. B. SKINNER COMPANY
SOUTH BEND 21, INDIANA, U. S. A.

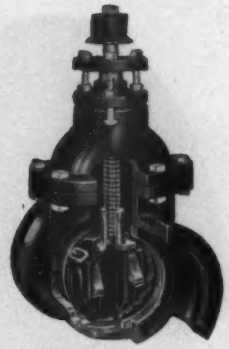


IOWA products

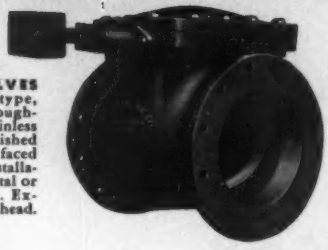
meet your most exacting specification

Superiority of Design, Workmanship, and Materials Assures Efficient Trouble Free Operation . . .

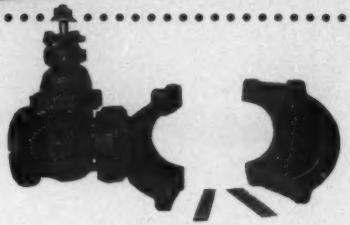
In every job



IOWA GATE VALVES—Simple, rugged construction, fully bronze mounted. Parallel seat, double disc type with independent solid bronze wedges and stem nut. Trouble free service assured.

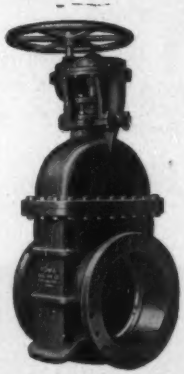


IOWA CHECK VALVES—Balanced swing type, bronze trimmed throughout. Equipped with stainless steel hinge pin. Furnished with rubber or leather faced disc if desired. For installation in either horizontal or vertical pipe lines. Extremely low loss of head.



IOWA TAPPING SLEEVES and VALVES—Sturdily built, easy to assemble and center on pipe. All bolted type with lead strips for tight sleeve connections. Extra long body sleeves with heavy flanges amply protect the cut. All sizes available.

IOWA FIRE HYDRANTS—Latest Corey type conforming to AWWA specifications. Will not geyser when standpipe is broken. Unique design provides unrestricted water flow with extreme low loss of head.



IOWA SQUARE BOTTOM VALVES—Specially designed for throttling service in filter wash and pump discharge lines. Square bottom features can be built into gate valves of any pressure ratings.

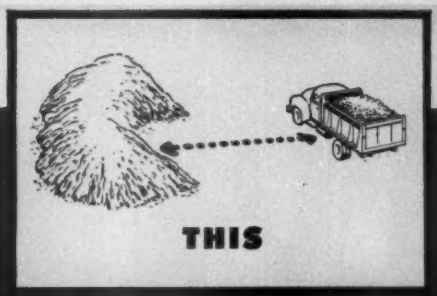
IOWA HYDRAULIC VALVES—Superiority of design matched with sturdy construction meets severe, continuous filter service requirements. Available with either iron, brass lined or brass tubing cylinders.

IOWA SLUICE GATES—Heavy cast iron construction, fully bronze mounted. Provided with solid bronze adjustable wedges. Suitable for seating and unseating pressures. Wide range of sizes.

Write today for descriptive literature.

IOWA VALVE COMPANY

201-299 N. Talman Ave., Chicago 80, Ill. • *A Subsidiary of James B. Clow & Sons*



...is the PROFIT WAY!

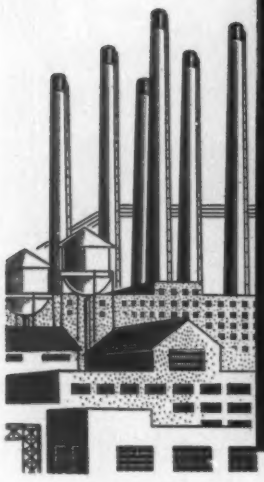
You cut out costly loading "detours"... save time and effort... with an Oliver Industrial Wheel Tractor and Strait-Line Loader. This revolutionary hydraulic, double end tractor-loader can load either in front or rear... dump in front. The operator can load and dump without twisting or turning the tractor... travel a *straight line* between pile and truck.

Rear-end digging gives you far more loads with far less effort. "Push-Tilt" bucket with penetrating lips gives you a bigger load every time. With bucket carried in the rear, *and low,* additional traction is created, assuring far greater mobility and maneuverability in any kind of going. Rear-carried bucket puts increased load on rear wheels for increased traction... lightens load on front wheels for far easier steering.

Investigate the Oliver—Strait-Line for your operations. Your Oliver Industrial Distributor will give you the complete details. Or, write The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.

THE OLIVER CORPORATION

A complete line of industrial wheel and crawler tractors



Non-clogging two-vane closed impellers, grease-lubricated anti-friction bearings, easy accessibility to the split stuffing-box gland and impeller eye . . . are typical of the many Worthington MIXFLO *features assuring low-cost, trouble-free sewage pumping.*

How is Bridgeport's Sewage Pumped?

It's full of industrial waste . . . a problem built for Worthington Pumps

Here's another municipality which has turned its sewage pumping over to Worthington—100%.

These five Worthington Vertical MIXFLO sewage pumps are located in Bridgeport's Westside sewage plant—installed in 1946. Three are 20-inch, two are 16-inch MIXFLOS.

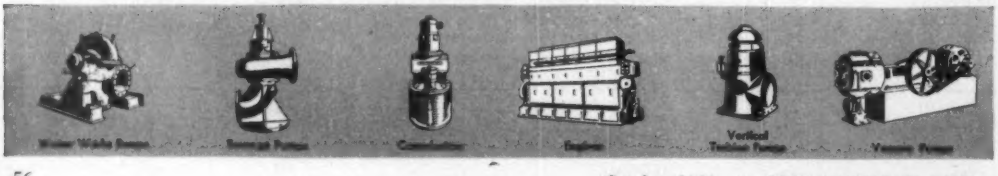
Bridgeport's Eastside plant duplicates these five pumps, and in addition uses two Worthington dry vacuum pumps and a Worthington air compressor.

In many other places, too, Worthington—world's largest manufacturer of pumps—is keeping pace with developments in sewage treatment and disposal by furnishing pumps of utmost dependability.

The Worthington MIXFLO line offers the industry's widest choice of sizes and types. So take a tip from New York, Chicago, Philadelphia, Bridgeport—find out why *there's more worth in Worthington*. Write Worthington Pump and Machinery Corporation, Public Works Division, Harrison, New Jersey.

WORTHINGTON

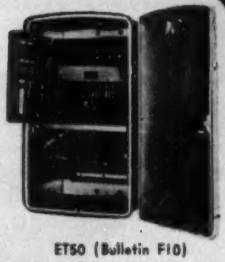
SEWAGE PUMPS W.I.1



EAGLE KEEPS TRAFFIC SMOOTH FLOWING

THE RIGHT CONTROLLER IS AVAILABLE FROM EAGLE

Whatever your needs, large or small, there is an Eagle controller to smooth out your traffic problem. Send your problems to Eagle and let experienced engineers furnish you a plan for longer lasting, better traffic contol.



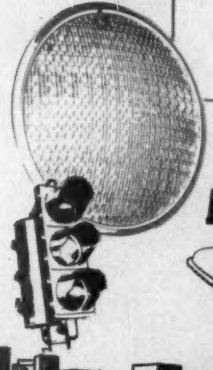
ET50 (Bulletin F10)
2-Phase Full Vehicle-Actuated

EM (Bulletin C10)

EA (Bulletin D10)

EF (Bulletin E10)

EM 6-Circuit pretimed non-interconnected
EA Basic 15-Circuit pretimed
EF Multidial, Expansible pretimed



Add more GO

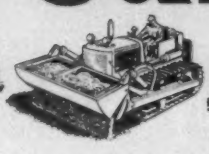
with EAGLE controll

A QUARTER CENTURY OF TRAFFIC CONTROL EXPERIENCE!

"Turns Garbage

Prepares the trench

Spreads and compacts garbage



Brings up and spreads cover

Irons and compacts the cover

SANITATION SPECIAL in Sheffield, Alabama—an International Crawler mounting a 2-yard Drott-Bullclam has just spread a pile of refuse, is about to crush and iron it out under the specially curved Bullclam front. Other International crawlers available with 1 and 3-yard Bullclams.

into Gold" *says Sheffield, Alabama*

How to increase property values with an International Crawler-Drott Bullclam unit . . . the only unit specially built to do all four steps of the complete sanitary fill job.

NEW LAND FOR OLD. An eroded gully is turned into beautiful, usable home sites by the Bullclam.

SMOOTH AND EASY, the Crawler-Bullclam spreads and grades a layer of clean earth over the compressed refuse.

Taxpayers in Sheffield, Alabama, were curious about their new International Crawler-Drott Bullclam, so its first garbage-disposal site was a ravine smack on the main highway and next to an expensive housing development. This way, everybody could see the Bullclam at work and form his own opinion.

People liked what they saw. Refuse disposal was cheap and neat. The property—formerly worth $300—was sold for $10,000, and a long list of citizens now want similar sanitary fill on their land.

Sheffield Sanitation Superintendent H. B. Fouche says, "Our garbage is turning to gold, as the Bullclam increases property values so much the owners can hardly believe it. As a result, the nearby city of Florence has bought a Bullclam, too."

The International Crawler-Drott Bullclam combination is the ONLY one-man equipment specially designed to handle all four steps of the complete sanitary fill job. It scoops out the excavation, spreads the refuse, crushes and grinds the bulk with brute International Crawler power behind the curved Bullclam front. Then it spreads and grades the cover dirt to finish the job.

It's a one-man wonder! Ask your International Industrial Distributor for details. Or write today to:

Drott Manufacturing Corporation, Milwaukee 8, Wisconsin
International Harvester Company, Chicago 1, Illinois

BULLCLAM BY

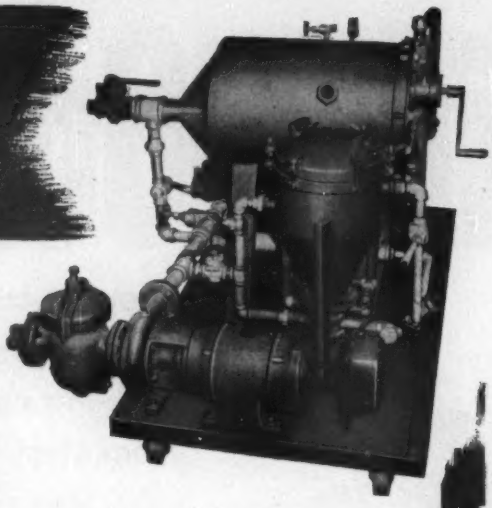
DROTT

POWER BY

INTERNATIONAL

POWER THAT PAYS

SPARKLER FILTERS



Contamination or failure of municipal water systems is probably the most serious threat to the survival of a community in the event of disaster. With Sparkler mobile filtration systems, however, every community is assured an adequate supply of safe, pure drinking water.

Sparkler Model SC diatomite filters are designed to filter large quantities of water quickly and effectively—at low cost. They are self-cleaning, and do not need to be broken down for either cleaning or inspection. The entire cleaning and pre-coating operation can be accomplished in 15-20 minutes so that the filter is hardly out of service.

Complete units, including filter, pump, slurry feeder, debris catcher, chlorinator, and gasoline engine can be furnished ready for mounting on truck or trailer bed. Filters are available with rated capacities ranging from 900 GPH to 72,000 GPH. These standard sizes, however, can deliver far greater quantities of water when necessary, although this is not recommended for general service. Write for literature.

Other units, designed for manual portability, may be supplied. Our Engineering Service is available for special design work or for modifications of standard models.

SPARKLER MANUFACTURING CO.,

MAXIM
SNOW THROWERS

Maxim self-propelled rotary snow throwers can increase your snow removal efficiency. Customers report savings well beyond cost of machine, in some cases after only 2 weeks of operation.

The Maxim Snow Thrower is self-propelled, throws the snow 40 feet away in any direction, no built-up banks, handles wet or dry snow. NOW USED IN 32 OF THE 48 STATES. Send for details and address of your nearest dealer.

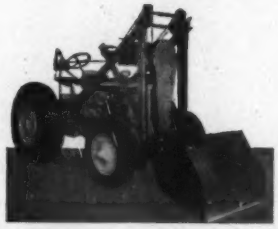
SEND THIS COUPON FOR DETAILED INFORMATION

THE MAXIM SILENCER COMPANY
84 Homestead Ave., Hartford 1, Connecticut

Name _____

Address _____

2MT51



White Front End Loaders Have Extensible Booms

The extending boom feature of White Loaders is highly commended by all users. It permits loading trucks without hand spreading or coming close to truck body. Can fill high bins or extend over walls.

Bucket is close to wheels when loading. At top it moves forward to discharge 2½' ahead. Can be dumped at any point in lift.

Mechanical operation, from front of engine. Backfiller blade goes in bucket seats.

Made ONLY for Oliver 77, 88; Case DI, SI, CI; Minn.-Moline UTI; International I-6, ID-6, I-30, ‡20.

Write for Catalog

Elkhart **White Mfg. Co.** Indiana

IN AMERICAN-LAFRANCE FIRE ENGINES

THERE'S *Extra Value* FOR YOU...

Better Visibility..

in cab-ahead-of-engine design

Actual photo of cab-ahead-of-engine pumper entering intersection. Driver has clear vision in all directions without truck entering cross traffic lanes.

Actual photo of old style pumper entering same intersection with front bumper in same position as cab-ahead-of-engine pumper. The driver cannot see traffic hazards.

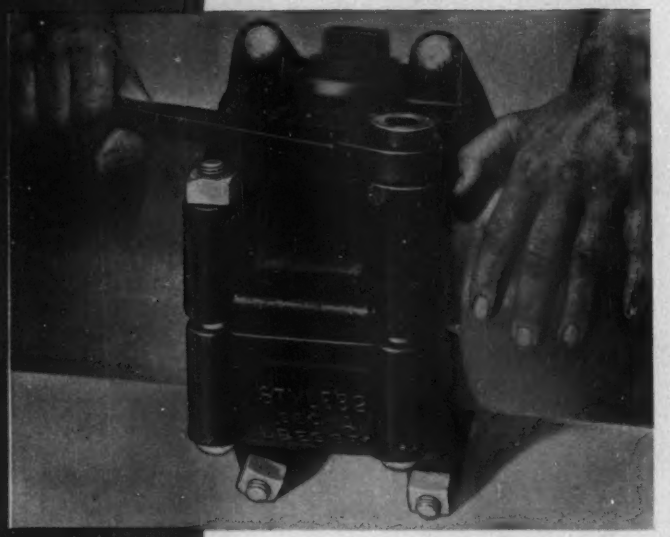
THE driver is up front in cab-ahead-of-engine design for maximum visibility and safety under all traffic conditions. He has clear vision in all directions, greater safety at blind street intersections. Power braking (hydro-vac) and easy steering combine with maximum visibility to insure arrival on every response. For maximum safety, insist on cab-ahead-of-engine design.

750 G. P. M. INVADER

• The tenth in a series of advertisements featuring EXTRA VALUE in American LaFrance fire apparatus.

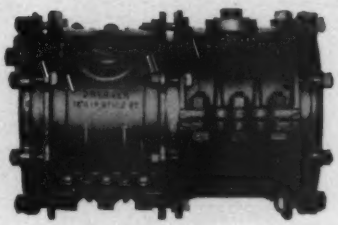
AMERICAN-LAFRANCE-FOAMITE CORPORATION
ELMIRA, NEW YORK, U. S. A.
LAFRANCE FIRE ENGINE AND FOAMITE LIMITED
TORONTO 9, ONTARIO, CANADA

ench . . . ten minutes



When winter breaks occur, be ready to make quick, *permanent* repairs with a Dresser "Adjustable" Repair Sleeve, Style 82. Regardless of weather, one man, using only a wrench, can repair a break or split in a matter of minutes. Interchangeable sections make these "pre-packed" repair sleeves adjustable to exact fit on all classes of AWWA pipe, and the specially compounded rubber gaskets introduce flexibility into your line.

The *low price* of the Style 82 offers genuine economy. Order now—to be sure you have a supply on hand for emergency repairs this winter. For CIP from 4″ to 8″ in diameter.



Dresser Split Sleeve, Style 57C, used singly or in combination (as shown above), encloses breaks, holes, splits in CIP longer than the Style 82 will accommodate. Available in sizes through 12″.

DRESSER REPAIR SLEEVES

Dresser Manufacturing Division (One of the Dresser Industries), Bradford, Pennsylvania; 1121 Rothwell St., Houston, Texas.
In Canada: Dresser Manufacturing Co., Ltd., 60 Front St., West, Toronto, Ontario.

For Low-Cost Rolling

Littleford's Model 157 Portable

TRAIL-O-ROLLER

Here's the most modern 2 to 3 ton Portable Roller ever designed for rolling patches on Road Maintenance work, Tennis Courts, Bituminous Walkways, Parking Lots, Driveways, Drive In Theaters, Airport Runways or wherever compaction is needed. This Model 157 Trail-O-Roller with its variation in compaction is the utility work horse for Contractors, Highway Departments, Park Departments, Cities and Counties. Its Portability and the ease of changing from trailing to rolling or rolling to trailing position makes it the most desired Road Roller of modern times. No trailer is needed to move this Model 157 to and from jobs; it travels on its own pneumatic tired wheels. Rolling to Trailing Position or Trailing to Rolling Position is achieved by a Hydraulic Lift.

For low cost Rolling with a Modern Roller, this Model 157 Trail-O-Roller is the answer.

LB LITTLEFORD

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1930

LITTLEFORD BROS., INC.
500 E. Pearl St., Cincinnati 2, Ohio

Here's a Way to SAVE TIME on All

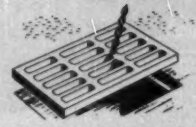
CITY, STATE AND COUNTY MAINTENANCE JOBS!

DUBÉ

DOES DOUBLE DUTY

PERFECT FOR ALL SPREADING OPERATIONS

DOES THESE JOBS TOO!



LIFTS CATCH BASIN GRATES AND MANHOLE COVERS

PULLS UP CURBSTONE

DUBÉ 5-STAR FEATURES

- ☆ NO HYDRAULIC FLUID
- ☆ 55° to 60° DUMPING
- ☆ 600:1 REDUCTION
- ☆ ALL-WEATHER UNIT
- ☆ SAFE — NO SLIPPING

The Rugged, 100% MECHANICAL

DUBÉ HOIST

WITH POWER UP AND POWER DOWN

DUBÉ makes a big hit with operators of trucks for city, county and state road maintenance work. Does a smoother, better job on all spreading operations . . . and double duty on tough lifting jobs. Positive power UP and DOWN assures instant control at all times.

SEND FOR FREE FOLDER

Please send me without charge or obligation a copy of your new illustrated folder.

FIRM_____

NAME_____

ADDRESS_____

CITY_____ STATE_____

DETROIT MECHANICAL HOIST CORPORATION
3503-12 WEST FORT STREET • DETROIT 16, MICHIGAN

when
ABRASIVES
are treated
with

SOLVAY
Trade-Mark Reg. U. S. Pat. Off.
Calcium
Chloride

they . . .

Stop skids quicker!

Last longer—go further!

Will not freeze in stock piles!

SOLVAY SALES DIVISION
Allied Chemical & Dye Corporation
40 Rector Street **New York 6, N. Y.**

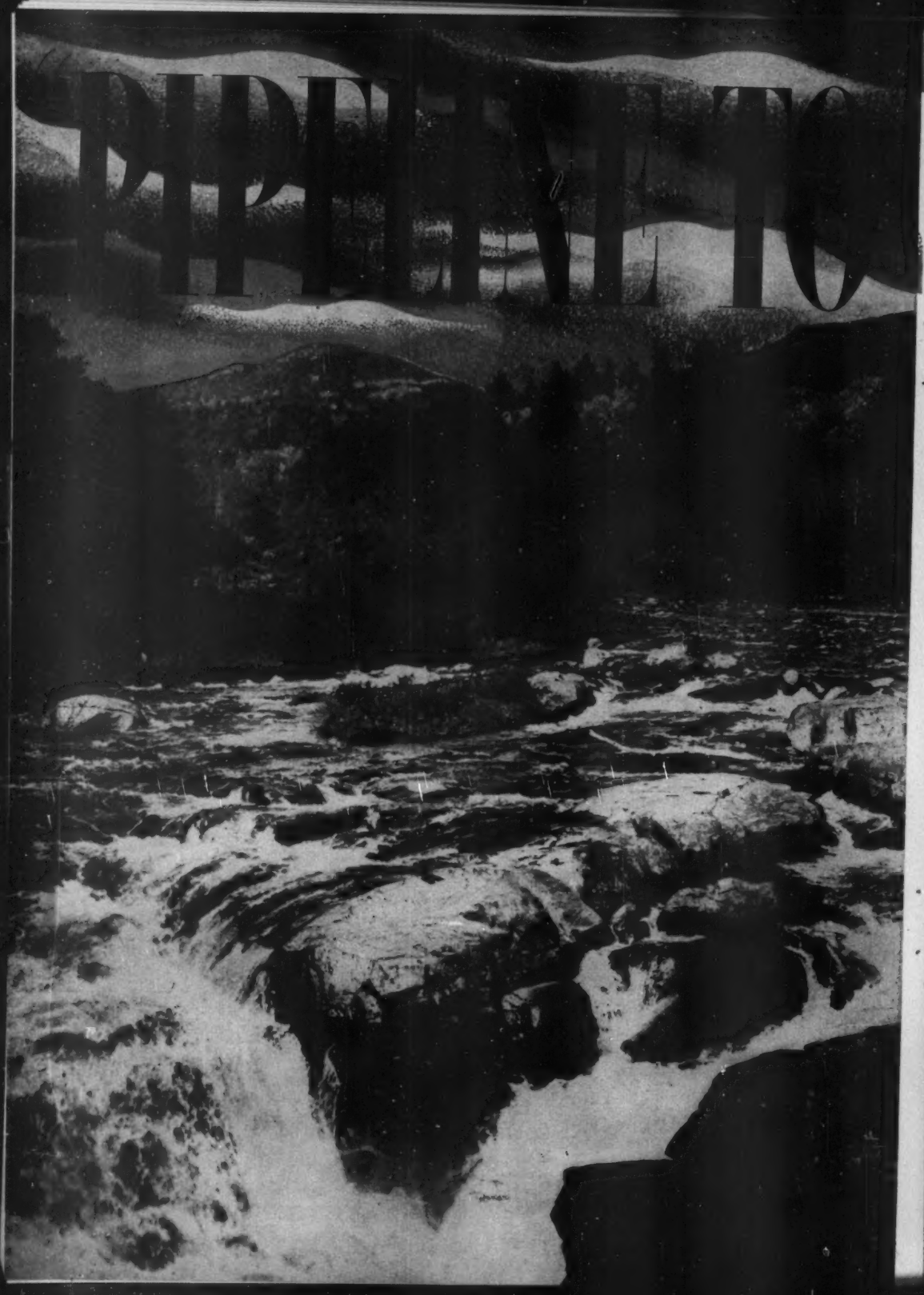
New York's City Hall, completed in 1811, as it looked 100 years ago

The City of New York has several cast iron water mains in service that were laid more than a century ago. They are part of approximately 5,000 miles of cast iron mains representing about 98% of all the pipe in New York's distribution system. The contrast in traffic and construction, above and underground, today and 100 years ago, is fantastic. Yet the shock-strength, crushing-strength and beam-strength of cast iron mains have enabled them to withstand the unforeseen stresses imposed by vast changes. Because of these strength factors and effective resistance to corrosion, cast iron water and gas mains laid over 100 years ago, are still serving in the streets of 38 cities in the United States and Canada.

United States Pipe and Foundry Company, General Offices, Burlington, N. J. Plants and Sales Offices Throughout the U. S. A.

U.S. cast iron PIPE

NUMBER TEN OF A SERIES


PLATO

THE CLOUDS"

. . . a dramatic new color movie—part of a stimulating package program that dramatizes the need for an adequate water supply in your community

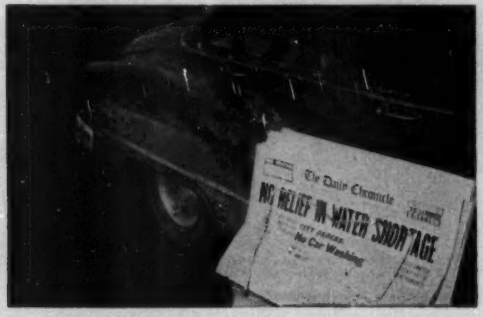
PLANNING—Emphasizes the importance of planning in improving water works. All community-action groups and leaders should see this film.

To aid water works executives in developing that most priceless asset—an informed public—General Electric has developed a non-commercial, unbiased packaged program. Endorsed by the American Water Works Association and U. S. Public Health Service, it is an extension of G.E.'s More Power to America activity and consists of:

- a 16-mm, 25-minute color movie that forcefully dramatizes how your community's social, business and industrial life depends on plenty of good water,
- a comprehensive, 40-page manual that gives result-getting suggestions on how to enlist public support for water-improvement programs in your community, and
- handouts highlighting important points of the film, for use at public showings.

More information about the G-E Water-Supply Program is available to any individual who is influential in developing his community's water system. *General Electric Company, Schenectady 5, N. Y.*

BEHIND-THE-SCENES—Shows the people of your community the many unseen operations necessary to assure them plenty of good, safe water.



SHORTAGE PREVENTION—Use the film to impress on civic leaders that "ten years from today is now in the water-supply business."

write today

A *free* copy of the manual, and further details about the Program, will be sent you if you request them on your letterhead. This helpful manual shows *why* you may need a new survey of your water system. It tells *how* to interpret your proposal, based on a survey, to the public. And then it describes *what* you must do, using examples from other communities, to gain public support. Write today for GEA-5555 to Sect. 666-67, General Electric Company, Schenectady, N. Y.

DON'T DELAY! WRITE NOW FOR YOUR COPY!

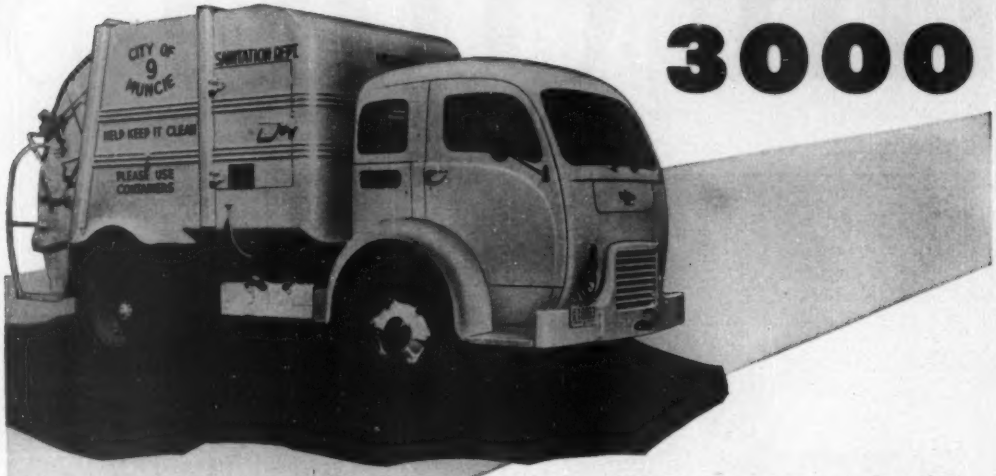
More Power to America

GENERAL ELECTRIC

666-67

Muncie, Indiana, says . . .

IT PAYS TO MODERNIZE WITH THE WHITE 3000



OUTSTANDING maneuverability with the White 3000 saves time . . . improves service . . . for City of Muncie, Ind.

SAVINGS you can measure at the end of every day make the White 3000 for city services an investment that pays *extra* dividends . . . for years.

City officials are enthusiastic about the time and cost saving advantages of this entirely new kind of truck. Its exclusive design features make it ideal for municipal services because it is engineered exactly to specific operating conditions.

Ask your White Representative for facts.

LOWER LOADING HEIGHT

EXCLUSIVE drop frame design lowers body height . . . makes it easier to load and unload . . . saves energy.

NEW DRIVER ADVANTAGES

New driving ease . . . better acceleration . . . outstanding visibility and safety . . . roomy, comfortable low-level cab.

SAVES DRIVING TIME

SHORTER turning radius and wider-tread front axle assure maneuverability that cuts delivery time and delivery cost.

CARRIES MORE . . . EARNS MORE

New weight distribution permits more payload on front-end . . . extra-capacity body without increasing overall length.

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

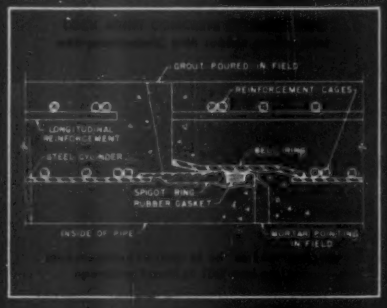
For more than 50 years the greatest name in trucks

Have You Enlisted?

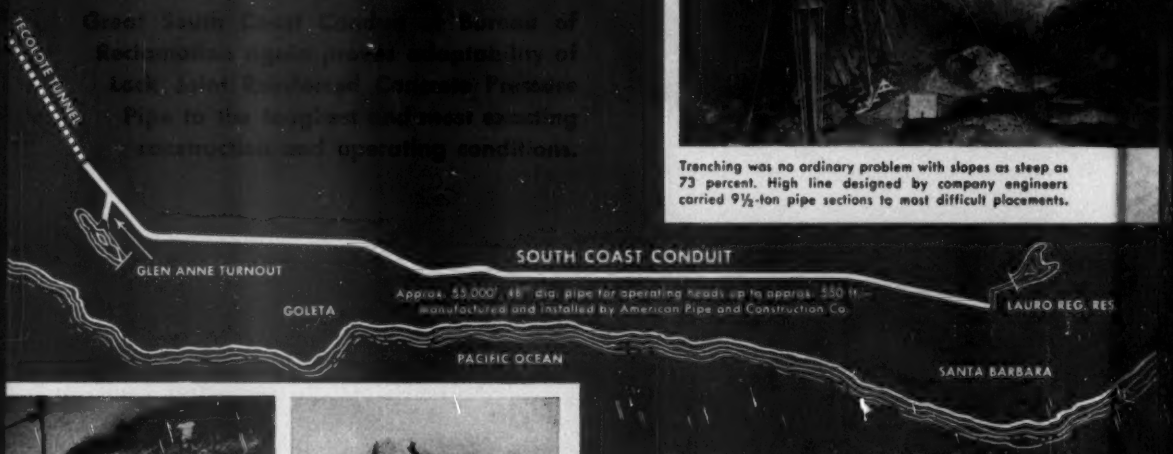
See Your White Representative For Facts

Tips its cab for service

Rough, Tough and Rugged!



Trenching was no ordinary problem with slopes as steep as 73 percent. High line designed by company engineers carried 9½-ton pipe sections to most difficult placements.


TECOLOTE TUNNEL
GLEN ANNE TURNOUT
SOUTH COAST CONDUIT
Approx. 53,000', 48" dia. pipe for operating heads up to approx. 550 ft.—manufactured and installed by American Pipe and Construction Co.
GOLETA
LAURO REG. RES.
PACIFIC OCEAN
SANTA BARBARA

1. Pipe laying was simplified to the maximum extent possible by use of Lock Joint Rubber Gasket Joints.

2. This 80 ft. deep cut was backfilled to a depth of 20 feet over the pipe. Lock Joint Pressure Pipe will sustain enormous external loads.

3. Entire line was engineered to go together piece by piece, including all fittings and specials, a characteristic advantage of Lock Joint Pressure Pipe.

Few, if any, main water supply lines have presented more difficult construction problems than the South Coast Conduit of the Cachuma Water Project. Spanning the mountains and valleys of the precipitous terrain between Tecolote Tunnel and the Santa Barbara area, the line was considered one of the toughest projects of this kind since the construction of the San Diego Aqueduct, which also used Lock Joint Reinforced Concrete Pressure Pipe. Now nearly completed, modern engineering and the superior qualities of Lock Joint Concrete Cylinder Pipe have helped make it practicable. Illustrations indicate some of the ways this versatile pipe met the needs of this rough, tough, rugged job.

This line is a brilliant example of permanent reinforced concrete pipe line construction. It will serve the Santa Barbara area for generations at peak performance and minimum maintenance expense. The same advantages are available to you for your project—advantages that mean reductions in the cost of delivered water.

American
PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines

P.O. Box 3428, Terminal Annex, Los Angeles 54, California

OAKLAND—SAN DIEGO—PORTLAND, OREGON

SPEED and EFFICIENCY you never thought possible in record keeping for governmental units

The Incomparable New

Burroughs Sensimatic

accounting machine

HANDLES ALL THESE JOBS – *and more*

Budgetary Accounting • Payroll • General Ledger • Tax Billing • Public Utility Billing and General Accounting • Cost Records

There's a new standard of accounting efficiency in many governmental offices today. It's a standard made possible by a completely new idea in mechanized accounting—the revolutionary new Burroughs Sensimatic with the "mechanical brain" that directs it automatically through every accounting operation.

Here is a new accounting machine with amazing versatility, speed and ease of operation. The Burroughs Sensimatic does a wide variety of accounting jobs with a saving of time, money and effort over former accounting methods. Just a turn of the job selector knob moves it speedily from one posting job to the next.

Find out today how the Burroughs Sensimatic can save working hours, reduce your accounting costs, and increase efficiency. And all at a surprisingly moderate cost, too. Call your local Burroughs office or write for complete facts. Burroughs Adding Machine Company, Detroit 32, Michigan.

WHEREVER THERE'S BUSINESS THERE'S **Burroughs**

Choose more than a truck—Choose an FWD for snow and ice control

You choose America's *most-proven weapon* in fighting snow and ice when you choose an FWD. Their success lies in FWD's better distribution of weight and power, providing maximum effort with minimum strain. When winter ends, FWDs go right on working, doing other heavy-duty highway maintenance jobs . . . grading, hauling.

You'll find FWDs have up to twice ordinary truck life . . . give you greater return per taxpayer's invested dollar. Models from 14,500 to 60,000 lbs. GVW — a complete line of 4 and 6 wheel drive trucks. Ask for the free FWD Model Book. See your nearby FWD distributor or contact FWD direct.

World-wide Sales and Service

The Four Wheel Drive Auto Co., Clintonville, Wis. • *Canadian factory:* Kitchener, Ont.

America's Foremost Heavy-Duty Truck

YOU CAN BE SURE OF QUALITY WHEN YOU BUY . . .

THE GENUINE

MIRO-FLEX

STREET NAME ASSEMBLIES

No doubt about it! Quality is apparent from first inspection. Letters are deep embossed on 18-ga. galvanized, "Bonderized" steel. Contrasting baked enamel colors for letters and border. Very rigid.

Miro-Flex street name assemblies are in demand the country over. They are made for all conventional street marking – two-way or four-way in pole top or bracket type. Write for complete catalog of standard signs for marking highways or streets and traffic control signs.

4-50

MANUFACTURED BY

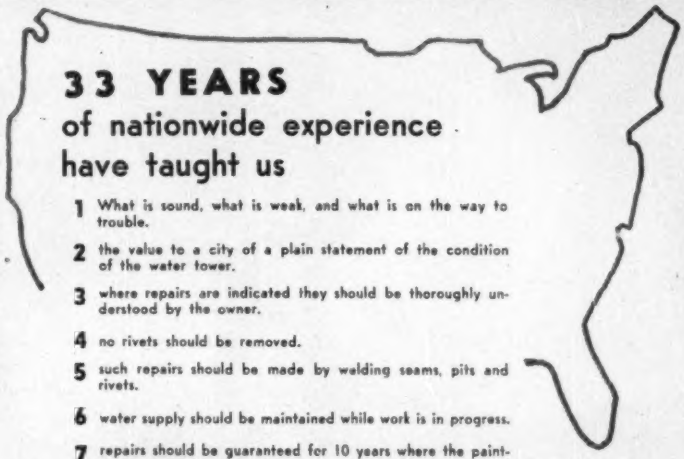
MIRO-FLEX CO., INC.

1824 EAST SECOND STREET · WICHITA, KANSAS

The Silent Watchman

REPRESENTATIVES IN THE FOLLOWING CITIES:

SALT LAKE CITY, UTAH	Box No. 1202
DETROIT, MICH.	Box No. 1423
RALEIGH, N. C.	Box No. 251
SYRACUSE, N. Y.	Box No. 681
BUTTE, MONTANA	Box No. 383
GREENVILLE, S. C.	Box No. 1074
TAMPA, FLORIDA	Box No. 1642
RICHMOND, VA.	Box No. 886
NEWARK, OHIO	Box No. 623
FARGO, N. D.	Box No. 1472
COLUMBIA, S. C.	Box No. 472
DALLAS, TEXAS	Box No. 1681
DENVER, COLO.	Box No. 2037
WAUSAU, WISCONSIN	Box No. 682
SAN FRANCISCO, CAL.	Box No. 1445
COLUMBIA, MO.	Box No. 522
SPOKANE, WASH.	Box No. 906
MACON, GEORGIA	Box No. 402
PROVIDENCE, R. I.	Box No 202



33 YEARS

of nationwide experience have taught us

1 What is sound, what is weak, and what is on the way to trouble.

2 the value to a city of a plain statement of the condition of the water tower.

3 where repairs are indicated they should be thoroughly understood by the owner.

4 no rivets should be removed.

5 such repairs should be made by welding seams, pits and rivets.

6 water supply should be maintained while work is in progress.

7 repairs should be guaranteed for 10 years where the painting is every 5 years.

8 painting on fully reconditioned towers should be guaranteed for 5 years.

9 inspections should be yearly at no cost to the municipality.

10 It's better to write us today.

DIXIE TANK & BRIDGE CO.

3523 Lamar Ave. P. O. Box 14 Memphis 1, Tenn.

"Specials" are a Specialty of LOCK JOINT...

Elbows, wyes, tees, crosses, outlets, manholes, reducers, bevels, adaptors... *any* special pipe you require is available in standard Lock Joint design. And if standard specials won't do the job, "special" specials may be designed to individual specifications. Lock Joint Concrete Pressure Pipe can be connected swiftly and efficiently to any standard water pipe of other material. All specials are engineered with the same care and high safety factor that have made Lock Joint the pipe of unexcelled durability and dependability.

LOCK JOINT PIPE COMPANY

Est. 1905

P. O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kan., Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla. • Beloit, Wis. • Hato Rey, P. R.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

CONSTRUCTION CASTINGS

for

Highway • Municipal • Building Industrial • Communication • Public Works • Airport • Utilities Transportation

Patterns for 15,000 different Gray Iron Castings used on Construction Projects.

Write for our 135-page

Catalog "R," Second Edition

NEENAH FOUNDRY CO. NEENAH, WISCONSIN

Chicago Office — 308 W. Washington St., Chicago, Ill.

GEOPHONE locates leaks without digging

"Registered in U. S. Patent Office"

When the discs are placed on the ground (as pictured) the Globe Geophone detects by sound the exact location of leaks in water or steam pipes. Acclaimed for its accuracy, the Globe Geophone has become indispensable in Public Works Departments and Industrial Plants throughout the United States.

• MONEY-SAVING

You save the costly expense of extensive surveys, excavating and replacing. The inexpensive Globe Geophone pays for itself many times over in money saved.

• ACCURATE

Operating on the principle of the seismograph, the Globe Geophone is without question the most sensitive and reliable instrument for detecting underground leaks.

Complete Geophone outfit consists of connecting tubes, two Geophone discs, headpiece, and heavy leather-covered carrying case with shoulder strap..... **$85**

Pipe Phone $3.70
(Aquaphone)

Globe Phone Mfg. Corp. Reading, Mass., U. S. A., Dept. Y

Manufacturers of Geophone Since 1918

ANTHRAFILT

(Reg. U. S. Pat. Off.)

A Filter Medium For All Purposes

Has outstanding advantages over sand and quartz media:

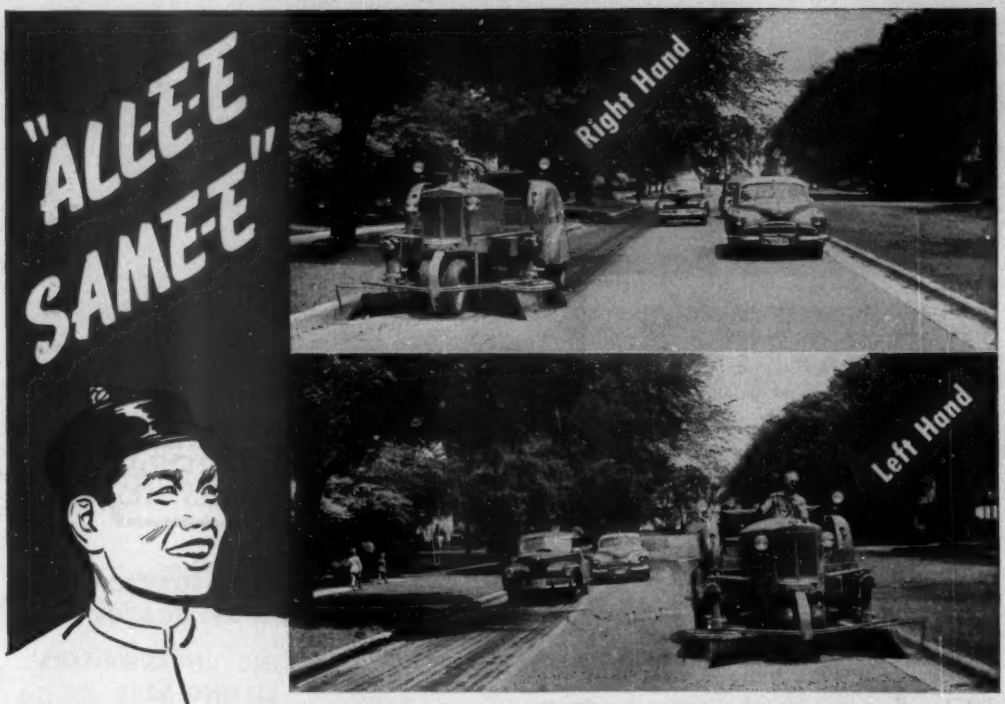
1. Length of filter runs doubled
2. Only about one-half as much wash water required
3. Less coating, caking or balling with mud, lime iron or manganese
4. Filters out of service less because of shorter wash cycle
5. Better removal of bacteria, micro-organic matter, taste and odor
6. Increased filter output with better quality effluent
7. Not just the top portion, but the entire bed, aids in filtering
8. Can be used in all types of filters using a filter medium
9. A perfect supporting medium for synthetic resins
10. An ideal filter medium for industrial acid and alkaline solutions
11. Decidedly advantageous for removal of fibrous material as found in swimming pool filters

Additional information, recommendations and quotations furnished upon request by

PALMER FILTER EQUIPMENT COMPANY
822 E. 8th St. Erie, Pa.
Engineers and Sales Agents

REPRESENTING —

ANTHRACITE EQUIPMENT CORP.
Anthracite Institute Bldg., Wilkes-Barre, Pa.



Separated Pavement — One-Way Streets — Island Areas

The Double Gutter Broom Model "40"

IS YOUR BEST BUY!

Best, Because there are no "blind spots." The operator has a perfect view of the gutter broom and the entire street . . . works with maximum efficiency and safety.

Best, Because with a full width seat up front, special driving and steering controls are not needed . . . the operator simply slides over on the seat a bit.

Best, Because the Model "40" can be purchased with a single gutter broom, and a second added later, as the need arises, at very little cost.

Fast, clean-sweeping, superbly maneuverable, the Model "40" answers the problems of state and municipal cleanliness in parks, streets, alleys, and on highways. From end to end it's built to do a cleaner, better job than any sweeper ever manufactured.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

Subsidiary of Baldwin-Lima-Hamilton Corporation

Austin Western

BALDWIN BLH LIMA-HAMILTON

COMPARE the COST

. . and you'll choose . . . TIFA

Before you buy a fog applicator, be sure to find out how much it will cost you to operate . . . how many bugs it will kill per dollar. No question, you'll settle on TIFA!

TIFA will save you money in overall operation . . . meet your most rigid specifications. For this amazingly effective unit is backed by 10 years' experience in manufacturing fog-machines. It carries the Underwriters' Listing Seal.

Each TIFA unit is compact, portable, one-man-operated. It handles solutions, emulsions, suspensions with a range of droplet control from 1/2 to 200 microns. It discharges insecticides in a clean DRY fog which spreads quickly . . . permeates tiniest crevices . . . is sure death to mosquitoes, flies and other insects.

For better health and better living,
put TIFA to Work in Your Community!

TODD INSECTICIDAL FOG APPLICATOR

CARRYING UNDERWRITERS' LISTING SEAL

Death-Dealing Fog For Insects

Write for illustrated folder on sensational TIFA—full details, official comments.

A Product of

COMBUSTION EQUIPMENT DIVISION

TODD SHIPYARDS CORPORATION

81-16 45th Avenue, Elmhurst, Queens, N. Y.

One Reason WHY

MI-CO Parking Meters are such

High Producers!

—*Quick Servicing Feature Cuts Nonproductive Time*

MI-CO Parking Meters seldom require servicing. But when one does need adjusting, it's usually a matter of only a few minutes right at the meter location. These illustrations show how easy it is to service a MI-CO. Simply unlock the meter—remove two screws—take off front of meter—remove two nuts—adjust—replace front, and the meter is back in service.

MI-CO's are simple to adjust because they have very few moving parts. So it's possible to detect the difficulty immediately since there are only four or five places to check. What's more, all parts are easily accessible.

You'll find that MI-CO's simple, rugged construction make service calls few and far between. You will also find that because maintenance is unusually low, earnings are exceptionally high. All you have to do is to check published records for substantiation of these statements. Furthermore, MI-CO's will give you ten years and more of new meter performance with earnings consistently high. We shall be glad to send facts and figures on installations in all parts of the country—many ten years and more old —which prove MI-CO's outstanding performance.

MI-CO METERS, 231 Court St., Covington, Ky.

Division of The Michaels Art Bronze Co., Inc.

A Marathon Runner...like Cast Iron Pipe...has

To run 26 miles over hill and dale in 2½ hours requires strength and endurance,—in a word, *stamina!* To carry on for 100 years or more, as cast iron water and gas mains are still doing in 38 American cities, also requires stamina. These rugged mains, installed in the days of horse-drawn vehicles, are now withstanding the traffic-shock of multi-ton trucks and buses and the soil disturbances caused over the years by underground construction of sewers, power lines, telephone conduits and subways. Yet cast iron pipe has survived these changes because of its crushing-strength, shock-strength and beam-strength.

No pipe deficient in these strength-factors of long life should ever be laid in paved streets of cities, towns and villages.

CAST IRON PIPE

STAMINA!*

*The Marathon race, blue-ribbon event of the modern Olympic Games (first held in Athens, Greece in 1896) was won in the record time of 2 hours 29 minutes 19.2 seconds in 1936.

CAST IRON

CAST IRON PIPE RESEARCH ASSOCIATION; THOS. F. WOLFE, MANAGING DIRECTOR, 122 SO. MICHIGAN AVE., CHICAGO 3.

SERVES FOR CENTURIES

SIMPLICITY of AMERICAN FROST BOTTOM METERS

REDUCES YOUR REPAIR COSTS

There's no worry about freeze-ups of American Meters causing high repair bills. The simple patented frost bottoms break at the correct pressure to protect all other parts, because they are not affected by the tightening of the flange bolts.

Even replacement frost bottoms give the same protection because the breaking pressure is pretested at the factory and predetermined by the machining which produces the correct tensile strength.

Complete data available — write today.

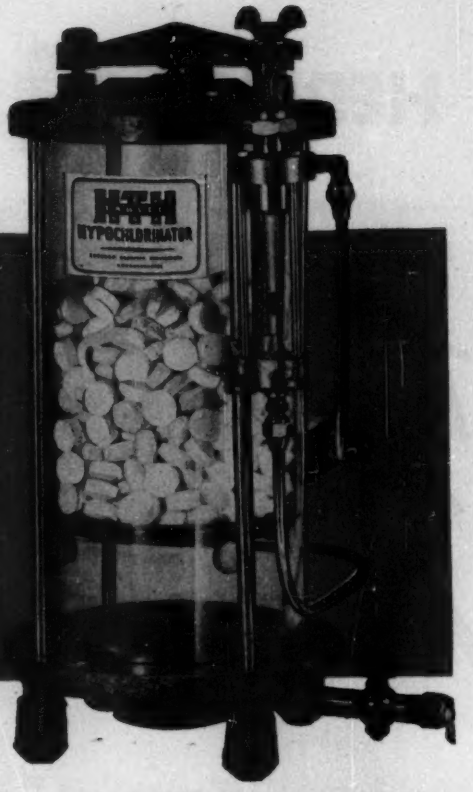
BUFFALO METER CO.

2902 MAIN STREET, BUFFALO 14, NEW YORK

A Great NEW Mathieson Team

HTH TABLETS

AND THE HTH TABLET HYPOCHLORINATOR



for EFFICIENT...ECONOMICAL CHLORINATION

NEW OPERATING EFFICIENCY!

For dependable chlorinating performance there's nothing like the new HTH Tablet Hypochlorinator. Compact, practical and efficient, it's ruggedly designed and constructed for simple, safe, easy operation.

NEW, SAFE, DRY CHLORINE FORM!

The new HTH Tablets, for which the HTH Tablet Hypochlorinator has been specifically designed, are a new form of the well-known Mathieson HTH. Containing 70% available chlorine, the tablets dissolve slowly to give a steady, controlled source of chlorine that lasts over a measured period of time.

NEW OPERATING ECONOMY!

This new chlorinating system has no match for economy. Its low initial cost combines with minimum maintenance to cut operational expense. The flow of water over the low-cost HTH Tablets is accurately metered to assure proper concentration without waste.

The HTH Tablet Hypochlorinator is readily adaptable to water works, swimming pools or sewage plants for treatment of potable water or industrial effluents, where atmospheric pressure or less is obtainable.

For information regarding your individual problems, write Mathieson Chemical Corporation, Mathieson Building, Baltimore 3, Md.

Mathieson CHEMICALS

SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

HERE'S *proof*

THAT TRIDENTS DON'T BECOME OBSOLETE

1898 *Trident Meter*

UP-TO-DATE TRIDENT PARTS

IN an old style water meter . . . no matter how often you replace worn out old parts with new old-style parts you've still got the same old meter.

BUT when you put UP-TO-DATE parts into an "old" Trident Meter (whose originally sound basic design has not changed in 50 years) . . .

BROTHER, you've got a water meter better than when it was new . . . a meter that holds its place alongside modern meters in accuracy and value.

THIS picture proves you CAN put new parts into "old" Tridents. Proof of how well they work is found in the records of many water departments.

231

The Symbol of Sustained Accuracy

NEPTUNE METER COMPANY • 50 West 50th Street • NEW YORK 20, N. Y.
Branch Offices in Atlanta, Boston, Chicago, Dallas, Denver, Los Angeles, Louisville, North Kansas City, Portland, Ore., San Francisco.
NEPTUNE METERS, LTD., Long Branch, Ont., Canada

This photograph is an aerial view of Kansas City, Mo., at the height of the flood.

Lessons from Disaster

for city government

By L. P. COOKINGHAM
City Manager
Kansas City, Mo.

MOST of the country knows by now that Kansas City, Mo., and Kansas City, Kans., suffered a disastrous flood on July 13. The waters of the Kaw River swept through Kansas City and into the Missouri River at the rate of 500,000 cubic feet per second, leaving vast destruction and hundreds of millions of dollars of damage in their wake.

Persons who should know tell us that the damage resulting from this flood was equal to that which might have been suffered by any city from an atomic bombing. Probably this is true of the surface damage, although the elements of human panic, medical care, and damage to underground utility facilities were present to a much lesser degree. At any rate, we in Kansas City did learn certain lessons in what might be called "disaster management"—lessons which would have application in the event of a bombing and certainly in the event of another city's being flooded.

It should be understood that most of the points covered in this article pertain only to the operation of a central headquarters for a city visited by a great destructive force, such as a flood or a bombing. I do not intend to cover, because of space limitations, the field operations of combatting a flood.

The general areas of administrative action to be considered in a disaster are as follows:

1. Organization and staffing

The conditions above are typical of those found in low-lying sections of Kansas City as the flood subsided.

Another view of Kansas City as the flood waters left the streets — burdened with litter, debris, and mud.

2, Public information
3. Communications
4. Identification and permit procedures
5. Conservation orders

When the flood struck Kansas City with its full force on the morning of July 13, I joined my Director of Public Works in his office to receive late flood reports. By the time we received warning from the United States Army Engineers that our Central Industrial District would be flooded, I had called together my key department heads, established a Flood Emergency Headquarters, and alerted my entire organization. The Directors of Public Works, Water, and Health were considered key; while the Director of Fire was in the field directing fire-fighting operations, and the Director of Aviation was directing operations at the Municipal Airport, and the Director of Welfare was coordinating relief and rehabilitation activities. The Director of Research and Budget was used as a Chief Staff Aid with the personnel of the Research and Budget Department acting as expeditors.

All of these department heads and key supervisors, except the Directors of Aviation and Fire, were physically centralized in the suite of offices normally occupied by the Director of Public Works, and well arranged for such use. This was designated as Flood Emergency Headquarters. The centralization of key personnel facilitated rapid coordination and a telephone amplifier installed on my phone enabled all persons in the room to hear field reports simultaneously.

As the flood waters started to recede, the organization was gradually de-centralized. The Water Department headquarters were established in an adjacent office on the same floor, while the Health Department moved to the floor above the Flood Emergency Headquarters. The Information Center, which will be discussed later, occupied the floor below Flood Emergency Headquarters. All other departments moved back to their own quarters and extensive use was made of daily staff meetings to coordinate activities. These staff meetings were recorded and copies of the proceedings were sent to each department head. Eventually, staff meetings were supplanted by daily flood bulletins, which were issued for 18 days.

Thus, the pattern of organization for the Flood Emergency Headquarters was one of great physical centralization during the height of the emergency and of gradual decentralization as the emergency abated and rehabilitation work started.

The staffing of Flood Emergency Headquarters presented peculiar problems in that it was necessary to have enough personnel, but not so many as to crowd the headquarters unnecessarily. As soon as was humanly possible, a formal organization delegating certain emergency responsibilities to each department head and appointing alternates for each Director in the Flood Emergency Headquarters was established. A directive was issued making this temporary organization official. Then all personnel were put on 12-hour shifts, and eventually on 8-hour shifts except for department heads and key supervisors. Personnel to handle incoming telephone calls and the typing of news releases and emergency orders were also delineated in writing.

It proved to be immediately necessary to establish a co-ordinated staff program under the direct supervision of the City Manager. This became the re-

Here crews are clearing gutters to allow proper drainage of one of the streets in Kansas City. When there had been as much drainage through the sewers as possible, a Hough Payloader was used to remove large accumulation of muck.

An Allis-Chalmers tractor-loader is scooping mud into a waiting truck equipped with a Hercules dump body.

sponsibility of the Chief Staff Aid, the Director of Research and Budget. This officer was made responsible for providing necessary staff and clerical aids, maintaining the proper records, seeing that communications were maintained throughout the organization, and keeping the Public Information Program on an even keel. However, all news releases and emergency orders were approved by me or my alternate.

Public Information

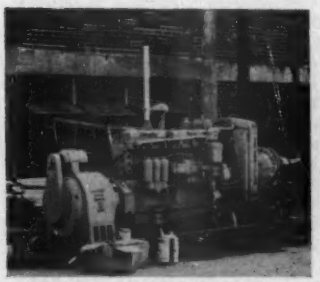
Our experience indicates that a properly developed Public Information Program is a most important part of any disaster program. As someone so aptly put it, "The public can stand anything as long as they know what is going on; but it is the unknown and mysterious which give them the jitters and cause a break-out of panic." Therefore, at regular intervals we attempted to issue to the press and the radio public statements on flood conditions and what was being done to combat those conditions. We found it best to be completely frank with the public, and they, in turn, were most cooperative. The issuance of periodic news bulletins presents its own problems. In order that this could be done expeditiously, we designated persons to call each radio station and newspaper as soon as news bulletins were ready for release. One person called one radio station or newspaper and each such person had a telephone assigned for this use. These phones were on the same floor as Flood Emergency Headquarters, but were on different lines from those over which incoming calls were handled. In this manner, all news bulletins were called to all radios and newspapers simultaneously; and I would estimate that our releases were being broadcast over local radio stations within an average of 15 minutes after they had been approved. This is indicative of the ideal cooperation we received from the press and the radio during the emergency.

Any information program must consider expeditious handling of telephone calls into headquarters. Many of the questions asked us during the flood emergency were of such a general nature that any well-informed person could answer them. Therefore, on the floor below Flood Emergency Headquarters, we set up an information center with about five phones to which calls requesting general information could be routed. This information center had its own switchboard (tied in with the central switchboard) and all of the information type of calls were routed there by our City Hall operators. This lessened greatly the load on the phones in central headquarters, allowing emergency calls to reach us in the central headquarters without delay. We also found that frequent issuance of news bulletins tended to reduce the telephone load on our City Hall switchboard, as well as at Police Headquarters and at the Red Cross. TV coverage also helped to keep people at home away from the disaster area and out of the way of disaster efforts.

During such an emergency it is very important that proper arrangements be made for handling press and radio reporters. Consequently, in Flood Emergency Headquarters we had installed five direct outside-line news phones, reserved for the use of newsmen only. This, I am sure, secured for us a great deal of cooperation from both press and radio.

It is most important that an adequate system of internal communications be worked out if confusion and poor coordination are to be avoided.

(*Continued on page* 156)



A Caterpillar D13000 electric set provides emergency power for an industrial plant in Kansas City, Mo.

Lessons Learned

OUT OF THIS experience, we in Kansas City learned certain lessons applicable generally in times of emergency or disaster.

I

Do not call for volunteers unless they are needed and can be immediately put to work. Caution must be used to prevent issuance of orders for volunteers or equipment without such orders' being thought through. Actually, extra equipment or personnel for which you have no immediate use will hinder your efforts rather than help.

II

The need for pre-planning is paramount. During the emergency in Kansas City, excessive time was needed to prepare and execute such things as conservation orders, identification permit plans, fire-prevention orders, etc. Many of these are things which, in the comparative peace of normal operations, can be thought out and well planned. If this is done, it will facilitate emergency operations to a great degree. Kansas City is planning to prepare, as insurance against future emergency needs, conservation orders for all types of utilities and public services which can be put into effect immediately as they are needed.

III

The burden of planning for rehabilitation must be carried during the height of the emergency. The very act of living and the operation of industry are highly complex undertakings today. Therefore, communication, utility, and transportation facilities must be reactivated as soon as possible. It is necessary to plan an organization for the clean-up of devasted areas and, if possible, to take advantage of the destruction to put redevelopment plans into operation. Such plans should envision the utmost utilization of men and equipment.

IV

One of the most important functions of the city manager or the city government is the job of getting business and industry back into operation as soon as possible, to prevent permanent damage to the local economy. During time of war this would be much more important, inasmuch as having an area such as Kansas City out of action for a considerble period of time would severely cripple the war effort. Therefore, a great deal of thought must be given to this factor; and the local government should assist in every possible way in seeing that the city's economy is returned to normal at the earliest possible date. This means that restrictions on traffic, water use, etc., must be relaxed as quickly as is commensurate with public safety and welfare.

NASHVILLE, TENN.

A Wide-Scale Expansion of the Water System

By ROBERT L. LAWRENCE, JR., *Director and Chief Engineer, Nashville (Tenn.) Water Department*

IT WASN'T the demand of war that strained our water system. What hurt us was the demands of peace. Our phenomenal post-war expansion, brought about by an extensive residential building program, soon showed that we badly needed a major expansion of the water system.

Therefore, shortly after the close of the war, upon the writer's recommendation, the Mayor and Council employed a firm of consultants to collaborate with the writer and survey our water system to establish soundly such an expansion program. Our consultants, the Chester Engineers of Pittsburgh, Pa., in a report in August 1948, submitted these recommendations:

1. Additions to the filter plant to bring the capacity to 56 gallons per day, consisting of:
   (a) Six additional 2½-million-gallon filter units
   (b) Additional settling basin or clarifier designed to continuously remove the sediment.
   (c) Addition of a grit chamber including three new aerators
   (d) A 12-inch direct connection from the force mains to the wash-water tank
   (e) Replacement of wash-water hydraulically operated gate valves with Rensselaer hydraulically operated square-bottom gate valves
   (f) Provisions for use of ton containers of chlorine
   (g) Palmer surface-wash for existing 18 filter units

2. A 20-inch supply main from the vicinity of the Kirkpatrick Hill Reservoir west to 44th Avenue

3. Additional reinforcing mains in the distribution system

4. Electrification of the George Reyer Pumping Station and the abandoning of the steam-actuated equipment. This can be accomplished in two stages, by first installing low- and high-duty electric pumps to be used in combination with the present steam-actuated equipment, to be followed within two years by additional electricity-driven pumps and the abandonment of the present steam-actuated pumps and boilers.

5. The construction of an additional high-duty (low service) force main from Green Street and Wharf Avenue to Eighth Avenue.

The basic objective of the expansion program was to raise the 40 mgd capacity of the Nashville system to approximately 60 mgd.

The most immediate post-war need was a new intake which could not wait for the more comprehensive study. This project was placed under construction March 25, 1947, and was completed and placed in service June 30, 1948; it was made available not a moment too soon.

The new intake has a capacity of 60 mgd and has for its standby the old intake with a capacity of 40 mgd.

The intake pier is a concrete structure, located in the Cumberland River, opposite the pumping station. The pier is 35½ feet long and 18 feet wide, with an inside space of 19 by 8 feet for sluice gates and traveling screen.

Details of the New Intake

The water, after coming into the pier, passes through a Link-Belt traveling water screen that extends from the bottom of the intake pier to the top. All water passes through screen baskets made of 12-gauge copper wire with ⅜-inch-square openings. All leaves, sticks, and debris are caught on the screen by the upward travel of the screen and lifted to the top where they are automatically removed by a powerful spray of water directed through the baskets. The debris is washed into a drain, carried to the downstream side of the pier, and discharged back into the river. Pressure water is furnished by a turbine deep-well type pump located in the intake pier. The traveling screen can be set to operate continuously or at stated intervals, and is controlled by a time clock.

This project was completed at a cost of $230,587. The remaining projects have been designed and placed under contract, the work to commence on each project in the order of its urgency. A 3,000,000-gallon reinforced-concrete auxiliary reservoir was completed and placed in service in the spring of 1950. This reservoir was located at an elevation several feet below the main reservoir, which has a capacity of 50,000,000 gallons, in order that it might float on the system controlled by the main reservoir. This project was completed at a cost of $231,000 and has contributed greatly to the fire protection in the area in which it is located.

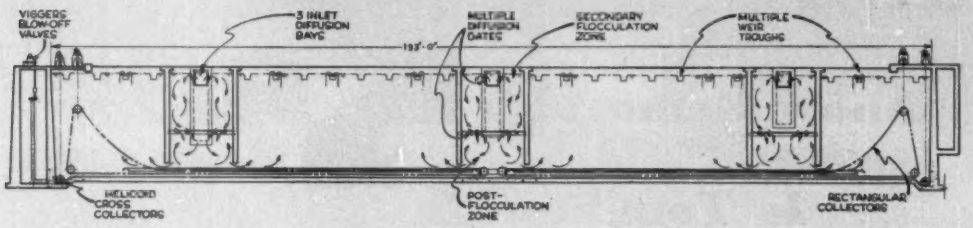
On September 14, 1949, a duplicate 36-inch raw-water line between the low-lift pumps at the main pumping station and the filtration plant, and a duplicate 42-inch high-lift suction line between the filtration plant and the high-lift pump of the main pumping station, were placed under construction and completed at a cost of $311,000.

These lines use American Cast Iron Pipe Company bell-and-spigot pipe jointed with Bondo, except at the fittings and valves where caulking lead was used.

In the fall of 1950, a contract now fulfilled was let for the installation of approximately 6,000 feet of 36-inch cast-iron force main at a figure of $398,824. Our main reservoir is 2,000 feet from the main pumping station, and the original force main connecting them was installed in 1888, the same year these two facilities were constructed. For many years, the city depended on this single line for an uninterrupted supply from the pumping station; this was not unsound since, for many years, the capacity of the reservoir was large in comparison with the average daily demand. However, in 1926 the line was duplicated for a distance of 12,200 feet. Now the use of water has increased to a point where it would have no longer been considered sound practice to forestall complete duplication of the original force main.

This line is bell and spigot, cast iron, cement lined, furnished by the American Cast Iron Pipe Company, and is known as Mono-Cast. Certain portions of it are lugged and bolted; others, where passing under railroad tracks, are made up of pipe with mechanical joints. The jointing material used was Bondo sulfur-compound joint except for fittings and valves, where lead was used for jointing material.

The next project was that of converting the main pumping station from steam to electric power. This project will be completed by the summer of



1952 at a cost of approximately $650,000.

The present station was built in 1888, and is of excellent construction, designed to accommodate such bulky, slow reciprocating equipment as a Holly-Gaskill vertical pumping unit and a large Allis-Chalmers triple expansion unit, installed in 1907. On this station the water supply of Nashville was almost entirely dependent for many years. This unit had a capacity of 20 mgd and pumped against a total head of 385 feet. It is my understanding that this was possibly the highest head up to that time against which a triple expansion engine had been designed to pump.

With electric power it will only be necessary to remove the triple expansion unit and replace it with a new 40-mgd electric-motor-driven centrifugal pumping unit. In addition, we are removing the turbines and gears from two 20-mgd steam units and replacing them with electric motors. Also, two 10-mgd steam units will, in a similar manner, be converted to electric power. We will have several synchronous motors of 2,250 hp, 1,750 hp, 900 hp, 600 hp, and others. As a matter of fact, the new 2,250-hp synchronous motor will be the largest motor supplied by our local electric utility.

Filtration Plant Expansion Costliest Project

We have also been carrying out over the last few years other important projects. Recently, we awarded the contract for a $1,500,000 expansion project for our purification plant. Last May we placed in service a new 3,000,000-gallon auxiliary reinforced-concrete reservoir in the western part of the city. Duplicate raw water and filtered water lines, 36 inches and 42 inches in size respectively, have been completed between the main pumping station and the purification plant. Many thousands of feet of trunk lines, 16 inches and 20 inches in size, have been installed.

The last and most expensive of the major projects is the expansion of our rapid sand-filtration plant. This work, involving $1,474,030.64, is expected to be complete in approximately two years. This plant's original capacity was 28 mgd. It was increased to 42 mgd in 1932, based upon a then accepted rating of 2 gallons per minute per square foot of filter-bed area. A rating of 3 gallons is now considered acceptable by many designers.

High Costs Make Complications

Such a re-rating would raise our existing filter-bed capacity from 42 mgd to 63 mgd; but would make our settling-basin capacity below the accepted standard. Originally, it was intended to increase the capacity of this plant from 42 mgd to 56 mgd by adding six additional filter beds with a capacity of 2½ mgd each. But when bids were received, the cost of construction had so risen that it was found necessary to cut the number of new beds from six to two, which would bring the new capacity up to 47 mgd under the more conservative rating of 2 gallons per minute per square foot of filtered-bed area. By only rating the capacity a conservative 20% instead of an allowable 50%, the original goal of 56 mgd can be attained; and it must be explained that all component parts of the expansion, such as clarifier units, settling basins, aerators, influent and effluent lines, are being added on a basis of 56 mgd instead of only 47 mgd. Only the beds are being eliminated at present.

This plant is also being completely modernized by the installation of mechanical clarifiers which will greatly increase the retention period through the settling basins.

The clarifier basin consists of two units each 193 feet 3 inches long, 32 feet 8 inches in width, and 14 feet 7 inches in depth. The clarifier employs the upflow principle of sedimentation and there is a continuous withdrawal of settled sediment by means of mechanical sludge collectors traveling the length of the basins and scraping the sludge to cross sludge-collectors at the ends of the basins where the sludge is discharged to a sewer.

Water from the mixing chambers enters the clarifier at six separate flocculating chambers, passing downward through baffles and passing under the dividing walls of the flocculating chambers. The water then flows slowly upward and is collected in steel draw-off troughs, spaced uniformly across the top surface of the basins. The equipment is manufactured by the Walker Process Equipment Company.

The sedimentation process employed will deliver a treated and clarified effluent of not over 10 ppm turbidity with an upward flow of 2 gallons per minute per square foot of net average cross-sectional area available to the rising fluid particles during final clarification, and with a rate of overflow that will not exceed 6½ gpm per lineal foot of outlet weir.

Chlorination

Palmer surface-wash is being installed throughout the existing beds, as well as in new beds. Provision is also being made for the use of ton chlorine containers which will cut appreciably the cost of chlorine by permitting us to purchase it in larger quantities. New chlorinating equipment has been designed of sufficient capacity for "super" or "breakpoint" chlorination. The plant will have two Wallace and Tiernan chlorinators, each rated at 2,000 pounds of chlorine per 24 hours. Chlorine can be applied to the water entering the grit chambers or in the mixing chamber or, as a third choice, at the end of the settling basin. Also provided is a residual chlorine recorder which charts the residual chlorine in the filter effluents. An additional high-service suction line is being installed so that water may be withdrawn from the clear wells at each end of the plant. This will add greatly to the flexibility of operation which is also looked upon favorably by the Fire Underwriters. The cost of this addition to our rapid sand-filtration plant when completed will be approximately $1,500,000.

This program was started during the administration of former Mayor Thomas L. Cummings, and is being completed under the administration of the present Mayor, Ben West.

Where Snow Removal Is Toughest

In Calumet, Mich., a Caterpillar diesel No. 12 motor grader widens streets, making snowbanks over 6 feet high.

A Caterpillar diesel tractor pulls a hand-power slusher, clearing snow and ice from streets in Lake Linden, Mich.

Houghton County tells how roads and streets are cleared where the drifting winds are strong and the snowfall averages 160 inches annually

By C. F. WINKLER
County Engineer
Houghton County, Mich.

THE CONTOUR of maximum snowfall across the United States crosses Keweenaw Point in the Upper Peninsula of Michigan in the vicinity of Calumet. This is a thickly populated area comprised of Houghton and Keweenaw Counties, the copper country of Michigan where the world's largest native copper mines are located. This point, or peninsula, extends into Lake Superior for approximately 60 miles. A carefully kept record of snowfall during the past 58 years shows a yearly average of about 160 inches. In 1947-1948, the local United States Weather Bureau reported a fall of nearly 230 inches. Last year's record was 286 inches.

The terrain is hilly; elevations vary from lake level at the shores of Lake Superior and the Keweenaw Waterway to approximately 700 feet above the lake at the Village of Calumet on the north and Painesdale to the south. Since Lake Superior varies but a few degrees in temperature in winter and summer, moisture-laden breezes, having crossed the lake, can deposit snow easily on the high plateau. Snow usually covers the ground by mid-November and it is not unusual to find that, when the ample sap begins to flow in the spring, the timbered areas are covered with a blanket of snow anywhere from 48 to 60 inches.

Houghton County has been denuded of nearly all its timber and has largely been turned into farms and grazing land, permitting the gales that sweep Lake Superior to blow unhampered over the Keweenaw Peninsula. The winds, coupled with a fairly low normal temperature, pile the snow in drifts reaching heights of 10 to 20 feet, blocking not only the rural roads, but the city and village streets as well. It is not uncommon to see a whole village street buried in snow to the second story windows.

Extent of Roadway

There are 112 miles of state trunk lines, about 100 miles of primary county trunks, 725 miles of secondary roads, and nearly 100 miles of streets and alleys in unincorporated villages and mining locations. Snow removal for vehicular traffic is intensive on the state and county trunk mileage and on the unincorporated village streets, and extends over about 50% of the remaining secondary system. During severe storms no effort is made to keep traffic moving on the secondary system. The secondary roads are opened as quickly as possible after the trunk lines are cleared.

The amount and quality of service rendered is determined by the funds available. The counties of Michigan that have a low assessed valuation, because of a constitutional amendment limiting the property tax to $15 per $1,000 of valuation, can raise no local funds for road work. All of the available funds are allocated by statute from the taxes collected by the state on automobiles, trucks, and gasoline. This allocation is based on amounts collected within the county plus another allocation based on mileage. Such a distribution of funds creates a hardship on the counties located in the northern part of the state which have a heavy snowfall, since southern counties with less than 40 inches of snow share equally with counties having a snowfall of 100 inches or more.

Since funds are limited, it becomes necessary for Houghton County to purchase equipment able to cope with the worst conditions. The county operates twenty-six 5- to 10-ton trucks, eight Sno-Go's, one Roto-wing, two tractor-type rotaries or Snow Kings, and a few smaller units. In order to make the use of this heavy equipment economical in light snow, all trucks are

equipped with 12-foot wings. These wings can be used to scrape the road surface in light snows so that a truck equipped with a 10-foot "V" type plow and wing can easily clean a path 15 feet or more wide.

Constant Preparation

Snow plowing on major roads is started with the storm and continues until its abatement. When the storm has ceased, preparations are made for the next storm. All accumulated windrows of snow pushed up by the displacement plows are eliminated. An effort is made to keep the snow along the edges of the plowed road no deeper than in the adjoining fields. The tops of the banks are thrown out with wings; narrow and deep cuts are widened with the rotaries and, finally, the remaining banks are brought into the road with reversed wings and thrown out either with the rotaries, or, if possible, with fast-moving truck plows.

Roads Rebuilt to Withstand Drifting Snows

Drifting snows cause all the difficulties. Roads when rebuilt are designed, located, and constructed with drift prevention built into them. Grades are widened, cuts are "daylighted," and all conditions tending to cause drifts are carefully studied and corrected when possible. Houghton County also uses approximately 300,000 feet of the popular 4-foot picket fence. In some places where conditions are bad and the rights-of-way are narrow, a method of building an 8-foot fence from the picket fence was evolved by using a heavier and longer steel post and superimposing a second 4-foot fence over the bottom row. This type of fence is much more efficient than two parallel rows of the same fence. Over 10,000 feet of this 8-foot fence is erected each year. Where rights-of-way are wider, a fence, probably unique in drift prevention, has been built. This is a permanent installation, not unsightly, left to stand the year around. Two rows of the 4-foot picket-type snow fence, one above the other, are hung between cedar posts and supported with ½-inch galvanized cables. Approximately 25,000 feet of this type of fence has been built. In extreme conditions, even a higher snow fence is erected varying in height from 12 to 16 feet. This fence is built of 144 pine boards nailed to cross members and supported on cedar poles of proper length. The higher snow fences cost more to erect each year, or to build for permanent installation, but do not have to be raised. Every bit of 4-foot fence in Houghton County is raised each winter after the first few storms have completely buried the fence and destroyed its usefulness.

Keeping the Village of Laurium, Mich., ice-rink entrances clear during the winter is the job of this Caterpillar diesel D4 tractor equipped with a No. 4 bulldozer. The rig is also used to clear walks and haul the garbage sleds.

Behind the choice and purchase of equipment, the erection of snow fences, and the routing and method evolved for snow removal, stand the employees of the Commission—the truck and equipment operators. To them falls the brunt of the work. Just because a man can steer a truck doesn't make him an operator behind a snow plow. Years of experience are necessary before the operator can feel his way over the highways through blizzards when the visibility is nil, piloting some $10,000 to $20,000 worth of equipment and accomplishing the task assigned to him. Houghton County operators are trained to drive all types of equipment over all sections of the county. This eliminates the strict routine of the operators' job and does not create a difficult situation in case of the absence of any one operator.

The one element of snow removal that is not mentioned in current articles is the necessity of keeping the entire snow mat from the pavements. This is accomplished by keeping the cutting edges of the plows close to the road and carrying very little of the weight of the plow on the runners or on the truck itself. If, because of continuing snow, a mat does form on the pavement, it is periodically removed with patrol graders. Bare pavements are safer and easier for winter travel and absence of a snow mat will save money and worry in slippery weather.

Balanced Fleet

Great strides have been made in the last 10 years by the manufacturers of equipment. Trucks, tractors, plows, and rotaries will do the work for which they are designed. Today, it is merely a matter of finances, and of picking out the best available equipment for the work at hand. A balanced fleet, consisting of light trucks with one-way plows up to the heaviest of equipment, would be ideal. But when money is scarce it is best to equip for the worst, because a plowed road, permitted to plug, is a source of grief to the engineer. The heavier equipment can be so operated and equipped that even in the lightest snow it can do efficient work, whereas a light truck will not plow out the heavier storms. The use of rotaries is strongly recommended in heavy snows because of the complete removal of snow and because the banks along the road are not increased to trap additional snow. Rotaries, too, will limit the use of snow fences.

Toledo Assesses Special Street Cleaning Tax

TOLEDO pays for its street-cleaning and snow-removal work on an assessment basis, according to the American Public Works Association. The assessment is directed against abutting property. Last year the average cost per front foot for these services was 20 cents, collected as a special assessment.

Seasonal service provided by the city includes placing ice-control materials on all major thoroughfares as well as on all streets in the central business area and at steep grades and hazardous curves; complete snow removal in the central business area, and plowing on all major thoroughfares; and sprinkling and cleaning all streets in the central business area each night and all residential streets every seventh working day. Toledo officials report that this method of financing street-cleaning work has been well accepted by the public.

Persistence Pays

in Sewage Purification

Long Beach, N. J., works for 10 years to get adequate sewers and treatment facilities; present system is self-supporting through service charges

By HOWARD E. SHIFLER
Mayor, Township of Long Beach, N. J.
and
Secretary of the Sewerage Authority of Long Beach Township

NEARLY 10 years of municipal persistence have gone into the planning, construction, and early operation of the modern sanitary sewerage system of the Township of Long Beach, located in southern Ocean County, N. J. The successful operation of the system today, and the remarkable percentage of units linked to its collection laterals and mains, forecasts a bright future for this project.

Although organized on June 17, 1941, less than six months before the attack on Pearl Harbor, as a Sewer Commission, it took no less than eight years to complete the system. The delay was caused, first, by the cessation of the Works Progress Administration as a cooperative element in financing and construction; next, by five long, hard years of war and material shortages; and finally, by the post-war delay in securing necessary equipment for the disposal-treatment plant.

Authority Formed

In 1947, it was decided to form a Sewerage Authority to take over the project. As a result, it was the first system to be placed in operation, under the new Sewerage Act, Chapter 138 of the public laws of New Jersey for 1946.

The system of sanitary sewers and the treatment plant installed by the Authority is a helpful part of the cash-basis "pay-as-we-go" arrangement which has characterized municipal finance in Long Beach Township during the 15 years I have served as chief executive. The Township comprises 12 of the 18 miles of Long Beach Island, in four resort segments, extending from Beach Haven Inlet northward to historic Barnegat Lighthouse. We build an average of 500 new homes each year, serve as host to hundreds of thousands of visitors and provide a rapidly growing public facility of necessary improvements, such as streets, waterways, safety services, and beach protection

It is a real tribute to the persistence of the men who have served on the old Sewer Commission and the present Authority, that this system, serving 1,500 users, is now in successful operation. At one point in the long drawn-out construction program, the Commission actually considered abandoning the installation of further collection lines and sewers, and writing off the project as a casualty of World II. Today, it is operating at less than 20% of its generous design capacity, with a remarkable expansion potential for the building of vacation and all-year homes in the famous "Gateway Resort" area from Beach Haven northward on Long Beach Island to Ship Bottom.

The total bonded indebtedness of the project amounts to $1,100,000 on a 40-year repayment program at 3% interest. The Authority was obliged to pay a comparatively high rate of interest, since this was the first system refinanced under the state's new Authority Act. Back in 1941, the initial plan for financing the installation of collection mains and plant called for a local $300,000 bond issue. The commitment of the Federal Government was for another $600,000, against which only 8% was paid when the WPA folded up in the face of World War II. Actually, it was the last federal project in New Jersey to be closed, mainly because it utilized over-age labor located a great distance from manufacturers of war goods.

Board Members

The original elected commission was comprised of three members: Chairman William J. Noonan, Sr.; Vice-Chairman Jack Lamping, and Albert I. Thornborrow, of Brant Beach, Beach Haven Terrace, and Beach Haven Crest, respectively. They were named at a special referendum called for approval of an issue of bonds by the voters of the sewer district. Later, Edward J. Green, of Peahala Park, served on the Commission as a replacement, and the writer served as Chairman throughout the war period, with Mr. Noonan being named Vice-Chairman.

As an Authority, under the reorganization plan, membership was increased to five. It included Howard E. Shifler, Chairman; William J. Noonan, Sr., Vice-Chairman, and Jack Lamping, Edward Green, and Martin J. Wida. Later, Richard Van Dyke was named to replace Edward Green, who resigned. When I was named Secretary in 1950, Mr. Noonan was elected Chairman, Mr. Wida Vice-Chairman, and Mr. D. Hilliard to the vacancy on the Authority.

First Year's Operation

The first full year's operation of the system proved the highly satisfactory nature of its basic design for service to a seashore community. The degree of sand and water infiltration was negligible. This is due in large measure to a re-designing of the system of collection mains and laterals affected durin the slow-down war years. Deep-level mains were shallowed and five auxiliary pumping stations installed as the backbone of the system along the principal thoroughfare, Long Beach Boulevard. The amount saved in pipe installation more than paid for the pumping stations.

The treatment plant has a daily pumping capacity exceeding half a million gallons. It will easily take care of the present home-development rate of 500 units annually for a minimum of 15 years. The treatment plant above-ground forms an attractive laboratory and office building. Located on the bay side of a narrow stretch of Long Beach Island, it has an outfall line one quarter of a mile to the ocean and seaward for discharge.

The seven basic steps in the sanitary treatment of sewage in our treatment plant are:

1. *Pre-chlorination* by Wallace and and Tiernan chlorinators of raw sewage at the influent manhole. This reduces all odors and the bacteriological count.

2. *Grinding* by Chicago Pump Company comminutors of the solid matter, flowing to deep-level suction wells.

3. *Pumps* by American Well Works, Inc., handling all sewage received at the plant and discharging into the primary settling ranks.

4. *Settlement* of suspended solids after being pumped from suction wells to settling tanks, where sewage is detained for a proper period for the gravity settlement of solids. These solids are scraped on the bottom of rectangular tanks by Chain-Belt mechanical collectors and dropped into collection pockets, removed by Carter sludge pumps, and forced into storage tanks for digestion and storing.

5. *Post-chlorination*, again by Wallace and Tiernan chlorinators; after the effluent passes over the end weir of the settling tanks, it flows to the secondary chlorine-dosing chamber where sufficient chlorine is given to sterilize the effluent.

6. *Serpentine chlorine contact tanks*: The sewage flows around the baffles of a contact chamber to permit complete mixture of the chlorine with the effluent.

7. *Disposal* of purified sewage through effluent chamber and gravity flow 2,000 feet from the sanitary-treatment plant, via outfall pipeline to sea, 1,050 feet east of the tide line, and 55 feet under the surface of the Atlantic Ocean, as required by New Jersey Health Department regulations. The sewage flow is measured by a Builders Iron Foundry venturi tube and chromoflow transmitter.

Withstands Storm Damage

The severe coastal storm of November 25, 1950, did not interfere or damage the operation of the sewerage system. Plant Superintendent William Siebrecht reported absolutely no storm damage, and the system in perfect operation, with almost no infiltration due to tight lines along every mile of the low-level seashore collection system of mains and laterals.

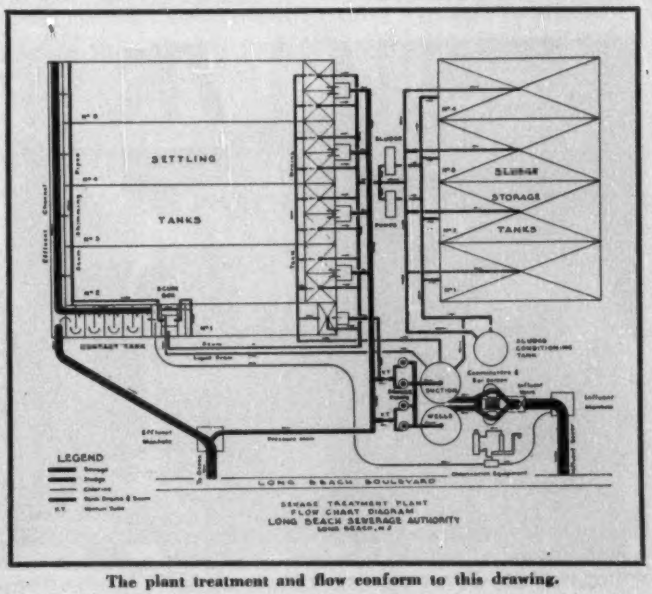
Ten years ago, the forecast was made that it would take upwards of five years to affect connection of all potential users living in the district, with the system. Members of the Authority were surprised by the almost immediate hook-up along the lines until a present count shows 1,429 of 1,500 potential home and business users actually connected, using the system and paying rentals after one year's operation. This splendid record is a result of the unsatisfactory conditions of the shallow cesspools and septic tanks previously in use. They were both a nuisance and a sanitary menace to the public health. The latter reason was the basis of a Letter of Necessity issued by the New Jersey State Department of Health following the war, to permit us to complete the system and place it in operation.

This attractive building houses operating controls for the Long Beach plant.

The Authority has a budget for 1951 of $52,550 in its revenue-fund account, with an improvement fund of $7,400. In recent weeks, the Authority has voted principal extensions of lateral collection lines to more than 250 unserved users and 328 standby building areas, adding $130,000 to the bonded indebtedness, with installations to be promptly completed. This will add an additional $10,000 in annual revenues, and provide much-needed service in areas which are rapidly developing resort colonies. It is a policy of the Long Beach Sewerage Authority to use every cent of available revenue, above the repayment of the bonds with interest, for increased convenience to users and valid extensions of the system of sanitary sewers.

The basic annual rental charge for a single-family dwelling with no rented room is $35. The Authority will act to reduce the charges as soon as possible, but it is now considered unobjectionable by users, many of whose homes are vacation or luxury homes, with a seasonal rental income value.

The Authority meets regularly on the



The plant treatment and flow conform to this drawing.

first Friday of each month, always with members of the Long Beach Township Commission and technical consultants, for prompt action and cooperation on all decisions. Since the system is now in operation, attention has been turned to such items as a detailed scientific insurance study which is saving $1,000 in premiums this fiscal year and installation of a pressure tank at the plant to use treated effluent to finish the various units of the plant. The annual saving of $500 in water charges on this item is enough to pay for the installation of the simple tank-and-pump system installed on the roof of the plant by the superintendent. Since sterility is not a factor in this operation, the use of potable water has been decreased 50% by volume, with a corresponding saving.

Employee-Benefit Plans

A New Jersey State pension plan has been instituted for the benefit of six employees of the Authority, to afford stability and security for their work well done. Adequate pay-raises to meet living costs have been consistently granted, as well as the award of praise in public for meritorious service. Members serve the Authority without salary; however, a $150 expense fee is granted each member annually for attendance at meetings. They are appointed by the Township Commission.

The system of sanitary sewers in Long Beach Township was designed by the engineering firm of William A. Goff, Inc., of Philadelphia, and installed under the supervision of these engineers and Project Engineer Thomas J. Taylor, of Brant Beach.

The financing was arranged by the firm of Boland, Saffin and Company, of New York City, under the personal direction of William H. Boland, of Red Bank. From the inception of the project, the law firm of Berry, Whitson, and Berry, of Toms River, with Colonel Franklin H. Berry as counsel, has provided legal advice.

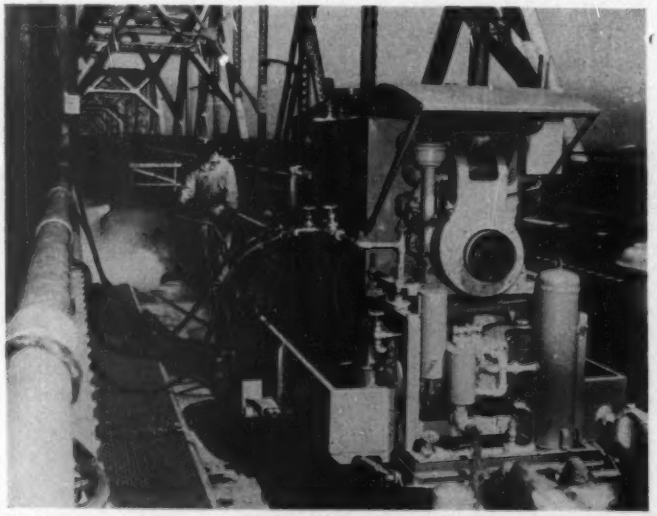
Steam Cleans a Steel Bridge

BRIDGES and many other structures need cleaning as well as do soiled clothing and hats, and steam-cleaning machines appear to be the modern bridge laundry.

Workmen, under the direction of D. E. Marsh, Maintenance Engineer in charge of painting on the steel bridge spanning the bay from San Francisco to Oakland, have pioneered in the use of high-pressure steam cleaning on steel bridges as a preparation for painting. His crews follow this routine procedure when protecting the big bridge against corrosion and rust:

1. High-pressure steam cleaning (150 psi, 3½ gpm, 325°F) to remove grease, sooty deposits from motor-vehicle exhaust, smudges from industrial fumes, ordinary dust, and salt deposited by the breezes sweeping in through the Golden Gate
2. Sand blasting all rust spots
3. Spot coating these twice with red lead
4. A coat of red lead all over
5. A final coat of aluminum

Steam cleaning as a preparation for painting on the Bay Bridge was not adopted without previous investigations. Exposed areas on steel surfaces were selected and the deposits washed off with distilled water. The washings were then analyzed. A deposit of salt was found 400 feet above the bay level. This study also disclosed that, during damp weather, sulphur-laden fumes from diesel-engine exhaust were converted into sulphurous acid, a formidable ally of rust and salt in quietly and persistently gnawing away at steel surfaces. The combination of salt, soot, and acid greatly favored attraction of moisture to expedite corrosion and rusting. The maintenance crews find that removal of such deposits by steam cleaning, as a preliminary to painting, removes visible and invisible deposits of salt, air-borne dirt from industry, and sooty smudges from automobile exhaust. It gives a better surface to paint and lengthens the life of the coating. Four high-pressure steam-cleaning machines, designed and made by the Malsbary Manufacturing Company of Oakland, Calif., are currently in use on the Bay Bridge.



High-pressure cleaning operations under way on the Bay Bridge; the machine delivers steam at 150-lbs.-per-square-inch pressure and 325° F. temperature.

Prefabricated Dwellings For Public Housing

THE local housing authority in New Albany, Ind., has become the first in the nation to use prefabricated dwellings for a permanent public-housing project, reports William E. Bergeron, Director of the Chicago Office of the Public Housing Administration. New Albany is the home town of Gunnison Homes, Inc., a prefabricated housing subsidiary of the United States Steel Corporation. Ninety-one Gunnison prefabricated buildings will be erected in the project; average room cost, including ranges and refrigerators, is $1,654. Average total-development cost per dwelling unit is $10,710.

The 91 prefabricated units will house 204 families in 81 one-story duplexes and 10 one-story four-family row houses. To meet current Public Housing Administration requirements, the Gunnison dwellings will be covered with asbestos siding.

Quaker State Cities See Sanitary-Fill Operation

The men who made the meeting possible: left to right, Walter Rosengarten, Engineer, Lower Merion Township; Robert D. Murrill, United States Public Health Service, and Russell Giese, Pennsylvania State Board of Health.

REFUSE disposal by the sanitary-fill method was introduced to eastern Pennsylvania and southern New Jersey municipalities last June in a meeting in Ardmore, Pa., sponsored by the United States Public Health Service. About 75 municipal officials from the Philadelphia suburban area gathered to hear this phase of refuse disposal discussed and later to see a demonstration of the method in an area adjacent to the joint sewage-treatment plant of Haverford and Radnor Townships.

In the preliminary discussion, Robert J. Thomas, Health Officer of Lower Merion Township, explained the advantages of the sanitary-fill method over other low-cost methods. About 50% of the municipalities, he stated, disposed of garbage by hog feeding. This method, while economical, results in the incidence of trichinosis in the hogs that makes the feeding an actual health problem. The open dump, often used, causes health problems by breeding flies, rats, and other vermin.

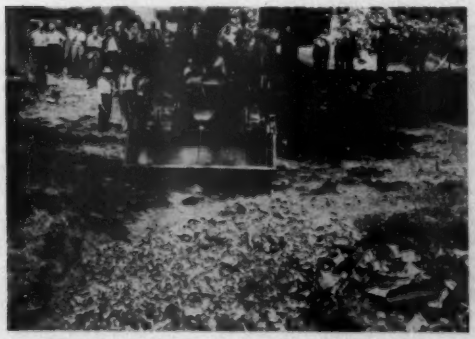
Russell Giese, Sanitary Engineering Consultant for the Pennsylvania State Board of Health, then explained that flies breed in a period ranging from five days to one week. They can fly at least one mile and possibly three or four. Experimental work that he had conducted in New York City sanitary-fill work indicated that after 72 hours, the temperature in the fill rises to 165° F., and stays that high for about one month. This illustrated that the natural temperature would kill most fly larvae, since they cannot survive a temperature of 122° F.

Other Advantages

Henry D. Hurral, of the Institute of Local and State Government, University of Pennsylvania, listed economic advantages of the sanitary-fill method, and quoted figures showing that the cost was roughly about 40 cents per ton, based on present published figures. He also pointed out the economic advantage of making a single collection of all trash, rather than a separate collection of combustible and non-combustibles required in other types of disposal. However, he pointed out the fact that incineration can reduce the amount of refuse-haul required, since the incinerator could be located in the center of population and only the residue would have to be hauled away.

W. S. Foster, Engineering Editor of THE AMERICAN CITY, listed certain engineering factors involved in sanitary-fill work. He noted that the fills require an average of six men per 1,000 yards per day, and 7 acre-feet of area per 10,000 persons served a year. The fills will settle 25% to 40% before becoming stable. They have been built successfully in residential areas where the amount of work was not large and have been operated successfully in areas where the temperature has dropped as low as 25° F. below zero by making the excavation first and stock-piling the earth. Robert D. Murrill, of the United States Public Health Service, made the concluding summary.

The demonstration of the sanitary-fill work was provided by the Drott Manufacturing Company, of Milwaukee, Wis., and Service Supply Corporation, of Philadelphia, with a Bull Clam mounted on an International crawler tractor. Also demonstrated was the operation of a Caterpillar tractor with a Trackson Traxcavator bucket furnished through the courtesy of Giles and Ransome, equipment dealers, of Philadelphia.



The Bull Clam tractor unit is ready to start operations.

The loader pushes the refuse forward into the trench.

Norfolk, Va.

City Officials and Military

Fight VD

By J. H. HARRIS, M.D.
Director, Norfolk City Venereal Disease Clinic
and
R. T. NICHOL
Administrative Assistant to the City Manager, Norfolk, Va.

THE vice situation in Norfolk is deplorable. Prostitution is rampant; venereal disease rates are high; the situation can best be described as "acute," reported the American Hygiene Association concerning Norfolk in 1948. Three years later, during 1951, the Association returned to Norfolk to make a new appraisal. The Association reported then that "Norfolk is as free from prostitution as any community of its size in the country. Norfolk is now poison as far as profits from prostitution are concerned."

Rate Drops

Since the beginning of World War II, Norfolk's population has increased 40%, from 144,000 to 214,000. Norfolk is the home of the Fifth Naval District, the world's largest naval establishment. In 1942 venereal disease rates hit a record high of 85 cases per 1,000 people annually. The program operating since the early war years and aimed at this high VD incidence has now cut the incidence to 17 cases per 1,000 annually. Indications are that the rate will continue to drop.

How was this significant reduction in the VD rate obtained? Experience during the first years of the war showed that many agencies in Norfolk were concerned with the situation and that these agencies were all trying in their own ways to fight the problem. There was little coordinated effort by the agencies and therefore there was confusion and lost motion. As time went by, the various agencies involved learned to work together until at this time there is a coordinated program accepted by all, with routinized operating procedures. The principle agencies participating in the program are: the Venereal Disease Control Activities of the Fifth Naval District, the Norfolk Police Department, the Naval Shore Patrol, the Armed Forces Disciplinary Board, the Venereal Disease Division of the City Health Department, and the Virginia Alcoholic Beverage Control Board.

The essence of venereal-disease control is to locate and treat active cases so as to prevent the spread of the disease.

Like most progressive health departments, the city VD division conducts wide educational activities to inform the public of the importance of the problem and to publicize the availability of the best type of medical treatment for these diseases at no cost whatsoever to the patient. Likewise, the Fifth Naval District, commanded by Rear Admiral R. O. Davis, emphasizes social hygiene in training its thousands of men.

But this is not enough. A close working relationship with all military agencies concerned with health and welfare is also necessary.

Procedure

In Norfolk a smooth-working arrangement has been developed. Suppose Seaman First Class Smith contracts gonorrhea—this is what happens:

1. Smith finds that he is sick and goes to a clinic at the Naval Base for treatment. If he does not report, the periodic "short arm" inspection will disclose the infection.
2. At the clinic he is seen immediately by a physician. After diagnosis he is questioned by a trained interviewer to learn from whom Smith caught the disease and perhaps to whom Smith passed it on. This Naval technician has been trained in interviewing methods at a school set up and run by the City Health Department. This training helps to give the interviewer valuable information concerning the city, and to gear his questioning toward obtaining productive information.
3. The Naval interviewer reports immediately to the city VD Clinic the information he has secured from Smith. The original reports are made by telephone or, less frequently, in writing, always at least within 24 hours. The telephone report is preferred because it is faster, and also because information given by Smith can be checked by the staff of the city VD Clinic while Smith is still having his interview at the Naval Clinic. Telephone reports are subsequently confirmed in writing.
4. Smith is then treated and cured at the Naval Base and during this time is restricted to the limits of the Base.
5. Subsequently, a member of the city VD staff calls the girl involved to the City Clinic by telephone if she is well-known, or by personal visit. Contact reports received in the VD Clinic from the Naval Base are followed up within a 24-hour period.
6. When the contact arrives in the Clinic, she is treated and cured by modern, quick treatment techniques. Here she is also interviewed for contacts.
7. A few girls, of course, refuse at first for one reason or another to accept treatment at the Clinic. Special efforts are made to secure their cooperation.

Tavern Owners Cooperate

A majority of the VD contacts are employed in, or frequent, the local taverns. If such girls refuse to come to the Clinic, the owner of the tavern is notified concerning their lack of cooperation without divulging medical information. He will bring pressure upon her to report to the Clinic. If she still refuses, he may discharge her and have her blacklisted with the other taverns in town. It can be argued that to deny a girl gainful employment is to force her into prostitution. But with an alert police department really bent on destroying this evil the girl finds this

activity also closed and must accept examination and treament or leave the city.

Do the tavern owners cooperate? A few years ago tavern operators were told that unless they worked with the various agencies involved in prostitution suppression and VD control, state legislation would be requested to prohibit them from employing females. Subsequently, the tavern owners formed an association which vigorously enforces a policy of self-policing. This association has representation at the monthly Armed Forces Disciplinary Board meetings.

Tavern operators also know that the Armed Forces Disciplinary Board, composed of high-ranking military officers of the services in the area, will place an uncooperative tavern off-limits to military personnel. Additional sanctions over tavern operators are held by the city police, the Shore Patrol, and the State Alcoholic Beverage Control Board which controls tavern licenses. Tavern owners soon learned that self-policing and cooperation in locating contacts for the health department pays off.

As a last resort, health officials request the police to keep the uncooperative girl under surveillance for possible violation of moral and vagrancy codes. Under the morals and vagrancy code a girl can be arrested and detained in the city jail. There, under state law, the girl must accept examination and treatment for venereal disease.

Of Special Note

In many respects Norfolk's VD-control program is similar to that found in most communities. However, in several instances Norfolk's program departs from standard practice. We feel that these innovations have proved their value and perhaps can be adopted by other cities.

● The first is termed the "veiled threat" approach, as discussed above, when dealing with potential procurers, tavern owners, hotels, etc. The heart of a VD-control program is the tracking down of the contacts once they have been reported to the VD Clinic. In a predominantly military area the female source of VD infection is usually the promiscuous, anti-social type with little or no motivation of community or self (health) interest. This "veiled threat" approach works deviously when dealing with this type of girl, as follows:

> The health department investigators use a completely voluntary approach when dealing directly with the girl named as possible source of infection. The girls are encouraged to come to the Clinic without even the slightest indication of threat. When they come, they are treated courteously and allowed to go about their usual business. *This gets around.*

But suppose Suzie decides not to come into the Clinic or just doesn't "trust" the health department. Suzie finds herself closely watched by the police and usually is finally arrested under the morals code.

Cooperation Between the Participating City Agencies

How did this come about? Primarily through close inter-agency cooperation. The health department drops a hint to the police, vice squad, and shore patrol to watch Suzie. No medical information of any nature is given. It is usually not too long before she violates the morals code. Should Suzie confront any health-department investigator with the statement that the health department is persecuting her, via these other agencies, she would be met with wide-eyed surprise and denial. Members of the VD staff are never seen in the company of personnel from the law enforcement agencies. It doesn't take long for her to wonder (our "veiled threat" approach) whether cooperation does not "pay off." It should be pointed out that this approach is reserved for the potentially promiscuous spreader who is concentrated in our "Main Street" area. Family contacts are handled in a very different manner by a nurse.

● The second contribution of the Norfolk program is the *emphasis on speed* of reporting information between the Naval agencies, who usually receive the first word from a man of his difficulties, and the city VD Clinic whose staff must find the girls. One of the characteristics of the girls involved is their highly transient nature. A few days or even hours can make a big difference as to whether they are found and brought to the Clinic and treated. The major contribution of the Norfolk program is the coordination which has been worked out between the various agencies involved for rapid exchange of information, primarily through use of the telephone.

● A third contribution is a new "hottel ordinance" which the city now has operating. Under this ordinance, hotel licenses can be revoked by city officials if hotel operators do not cooperate in the city's efforts to control veneral disease. When legal actions are contemplated against hotels, the health department is first allowed to proceed with its investigative work. This keeps the contacts and their cohorts from being "scared off" before girls can be located and treated.

● Another legal feature of Norfolk's VD-control program is the "taxicab ordinance." Prior to 1950, over 200 individual cab owners were operating, each with an individual "certificate of convenience and public necessity." The new ordinance required all cab owners in 1950 to consolidate into only four companies. Now the Director of Public Safety, dealing with only four cab managements, is able to exercise much more effective control over the entire taxicab situation.

● The city's judges also facilitate the program by taking a keen interest in its objectives and disposing of their moral cases accordingly. Stiff sentences are given to the habitual, hardened offenders. Young girls—relatively innocent and first offenders—are sent home.

● Another contribution is the training given Naval interviewers at the city VD Clinic by local physicians and investigators. Besides learning technical skills, and receiving knowledge of the city's "underworld", the Navy personnel meet the city VD staff with whom they will be working, at the other end of a telephone, when they are on duty.

● City, officials pay high tribute to the Norfolk Police Division, under the supervision of an ex-Marine General, for its vigorous anti-prostitution efforts. The objective of the police for the last two years has been to drive out of town, or out of business, all individuals who make money directly or indirectly from prostitution. This group includes landlords, cab drivers, bell-hops, bartenders, and dishonest police officers. The police drive in this connection has been singularly successful.

Recreation—the Positive Approach

The positive side of VD control in Norfolk is the comprehensive recreation program started to fill the void created by the stringent suppression of vice and prostitution. During World War II Norfolk was commonly called a "bad liberty" town. Recently a citizens' committee, called the Armed Forces Recreation Committee, was established by the City Council to evaluate and plan wholesome recreation for the thousands of sailors in the area. Their action program to date has included name band dances at the Municipal Auditorium, a downtown information center with recreation guides and free tickets to various events, and the promotion of home visits where families take into their midst the lonely serviceman. Under consideration is the organization of a private downtown club for enlisted personnel to parallel the officers' clubs at the Naval Base. Here the seaman will consume his liquor purchased at a State Store in wholesome surroundings and not have to resort to a few quick, long draughts in an automobile or alley.

Editor's Note: See also article, "Social Hygiene is Good Business," in The American City for September 1950.

This is an aerial photograph on which have been traced lines which show the areas that would be affected under the proposed West Palm Beach expansion program. Lake Worth, Palm Beach, and the Atlantic Ocean are in the distance.

WEST PALM BEACH PLANS

Huge Expansion Program

By KEITH R. CHINN
City Manager
West Palm Beach, Fla.

A UNIQUE example of cooperation between a private water company and a city government has led to detailed plans for a "Westward Expansion Area" development in West Palm Beach. It calls for the improvement of 5,195 acres of virgin swampland at an estimated cost of $13,275,000 over a projected 25-year period.

Both the city government of West Palm Beach and the West Palm Beach Water Company have accepted the plan in principle. The program involves development of separate areas and making them available for private building after drainage, utilities, and all other facilities are installed. It is expected that land costs will be low because the water company will gain increased and better-protected storage facilities as a result of the plan and the city will derive increased tax revenues from the improved areas; in addition, the development will help the city solve many of its current growth problems.

West Palm Beach has literally been "busting" its seams. Land for residential use is badly needed. Last year, the city had its greatest year for construction in more than 50 years of existence. Geographically, the city limits extend to the north and south for seven miles, but the city's growth on the east has been restricted by the waters of Lake Worth, and on the west the mile-wide city limits have been bounded by an unincorporated area owned by the West Palm Beach Water Company and its two big storage lakes—Clear Lake and Lake Mangonia.

When a controversy developed between the West Palm Beach Water Company and the City of West Palm Beach over the use of land which the city sought to buy for housing development, a committee of five engineers was formed to represent those agencies that have an interest in this area. These were the City of West Palm Beach, the water company, the Central and South Florida Flood Control District, Palm Beach County, and the Town of Palm Beach, which lies immediately east of West Palm Beach, but which is served by the water company.

Agencies Agree

All agencies involved agreed to follow the recommendations of the committee which reported, after preliminary study, that expansion to the west was both possible and practical, and, most of all, badly needed. The committee recommended that an expert national planning firm be engaged to prepare a scheme for proposed development. Harland Bartholomew and Associates, city planners, of St. Louis, were given this assignment.

It took several months for the Bartholomew firm to gather the data necessary for plan preparation. The plan makes use of a proposed superhighway which will define the western boundary of the expansion area, with provisions for two large clover-leaf intersections. From there, the new development will accommodate several other major streets which are designed to feed traffic into Palm Beach, Riviera Beach, and with several access roads to West Palm Beach. Through traffic will be discouraged through residential areas.

The over-all plan calls for using proposed construction by the Central and Southern Florida Flood Control District of two canals, part of the FCD program. One is C17, providing drainage from Lake Mangonia north to the Earman River Canal, and the other, C18, would conduct water from the Loxahatchee Marsh watershed into the storage lakes.

Preliminary development calls for the construction of a canal by-pass bringing water from the watershed into Clear Lake, construction of a dike around Lake Mangonia to 18 feet above sea-level, dredging the muck out of the lakes and the area between the lakes and the Seaboard Airline Railroad, then filling this area with sand and making it available for housing development.

The expansion area is to be filled as needed with proper proportions of sand and muck suitable for the purposes for

which the "new" lands are to be used.

Lake operating levels are to be 14½ feet above sea-level, leaving a 3½-foot freeboard and storing 4,000,000,000 gallons of water. This represents 333 days of water use at the average 1950 daily demand and 160 days of water use at the estimated 1975 demand, considerably in excess of normal water-storage requirements for communities this size.

The plans also call for a sewage-collection system with early completion of a sewage-collection and primary-treatment plant at 23rd Street and the railroad for use by the proposed housing area. The planners state the primary-treatment plant can be converted easily at a later date into a lift station in a permanent system.

Of the 5,301.51 acres of projected development, the water company and the city own or control 4,888 acres; the balance is held under various ownerships.

The proposed development of this acreage will be as follows: lakes, ponds, and canals, 1,196 acres; parks, 56; playgrounds, 29; schools and neighborhood parks, 172; college site, 26; community and recreational use, 56; golf course, 143; semi-public area, 35; commercial use, 113; industrial use, 50; water company, 73; county farm addition, 22; street right-of-way, 216; streets, 788; hotel sites, 21; motel and trailer areas, 89; white rental area, 330; non-white rental, 155; white single-family areas, 165, and non-white single-family areas, 69.

Breakdown of estimated costs for the development is as follows: dredging and earthwork, $2,115,000; storm-drainage system and structures, $970,000; water distribution system within neighborhood areas, $983,000; sanitary sewers and lift stations, $1,678,000; street lighting, $112,000; streets, paving, curbing, and walks, $4,980,000; bridges, $505,000, and landscaping, $182,000, totaling $11,525,000 with $1,750,000 for contingencies and engineering, making a grand total of $13,275,000.

Putting the Muck to Use

The first step, of course, is preparation of the land for expansion, which entails a gigantic pumping and dredging operation and moving more than 3,500,000 cubic yards of muck plus 13,000,000 cubic yards of sand.

Since muck, because of its spongy qualities, cannot be used as a base for construction, planners were faced with the problem of what to do with 3,000,000 yards of the stuff. The answer was to put the muck into the lake, mix it with sand, and then dredge it out again and use it for fill.

The plan provides for changing the entire drainage characteristics of the area, sloping the land from its present direction of draining east into the ocean to a pattern of draining to the north into the Earman River, and thence into the ocean.

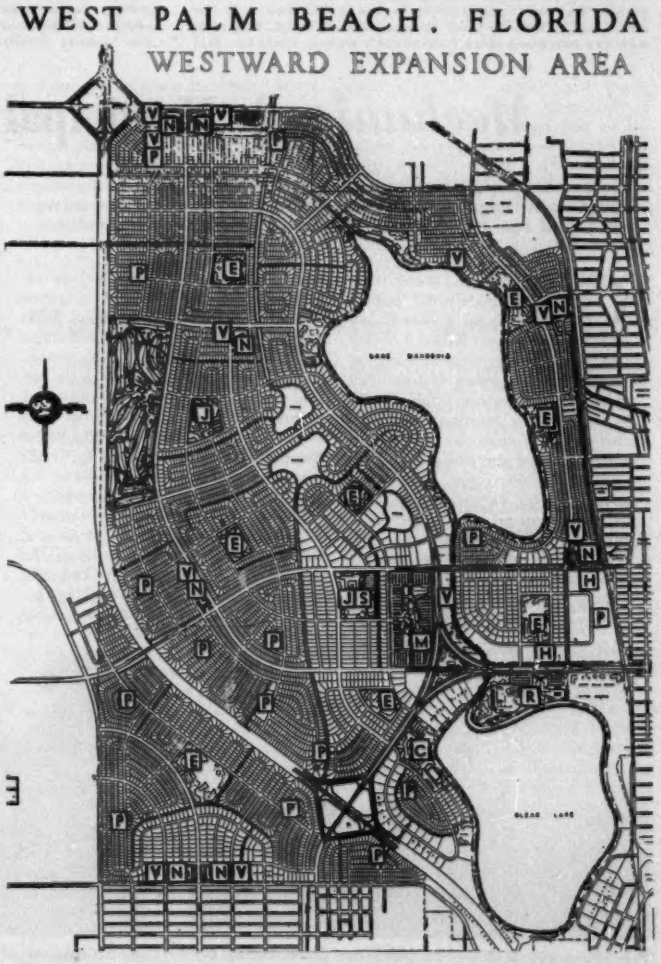
Most unusual about the big switch in direction of drainage is that the land will be shaped back to its original form —just the way it was when the first settlers pushed through the swamps. Since then, roads and dikes have been constructed in the area and during the course of time the direction of drainage was changed.

This change in drainage greatly restricted the use of the natural watershed as storage for the water-company plant, but engineers have made plans to link the two lake reservoirs to a large canal which will extend far inland toward Lake Okeechobee, the second largest body of fresh water in the United States and a good eventual source of water for the Palm Beaches.

The First Step

To get the program under way, as soon as the temporary water-feed canal is in operation and the retaining levee around the muck areas completed, dredging of muck will start between the two lakes. When this muck is removed, the dredge will replace it with enough

(*Continued on page* 159)



The letters on the plan have the following designations: E—elementary school; J—junior high school; S—senior high school; M—major commercial area; P—playground; R—recreational area; C—college campus; H—public housing area; N—neighborhood shopping center, and V—public and semi-public use.

The demonstration, above, conducted by the Marlow Pump Company, of Ridgewood, of an assortment of portable pumps was very popular, as it was a hot day and the scene was a near-by cool brook. Above, right, two men with two machines show how to cut a trench, excavate, and backfill for a sewer line. An RPB Mighty Midget does the pavement breaking. A Sherman digger mounted on a Ford tractor makes the excavation. After the work was completed the same digger bulldozed the earth back into the trench; finally, the RPB unit tamped the backfill.

Mechanized Municipal Services

Record-breaking American Public Works Association Chapter meeting in Ridgewood, N. J., shows how mechanical equipment provides the services demanded in today's municipalities

RIDGEWOOD, N. J., found itself with approximately 425 public-works visitors on its hands last August 30, when Mayor Albert J. Faber played host to the fall meeting of the New York-New Jersey Metropolitan Chapter of the American Public Works Association. The meeting was highlighted by 26 equipment distributors, who demonstrated everything from lawn mowers to mobile cranes, from sewer cleaners to street sweepers. The meeting also featured an extensive series of inspection trips. These included visits to the Ridgewood Water Department, notable for its well-equipped meter-test shop, its new service building, and its two-way radio-communication system. Inspections also included an examination of the portable irrigation system used to keep Ridgewood parks green. A Marlow 4-inch centrifugal pump delivers the water to the system. It uses light aluminum pipe easily carried by one man, with flexible couplings. The pipe and couplings were a product of the Irrigation Equipment Company, of Eugene, Ore. Ridgewood's 3-acre swimming pool, operated by the Division of Parks, also was inspected.

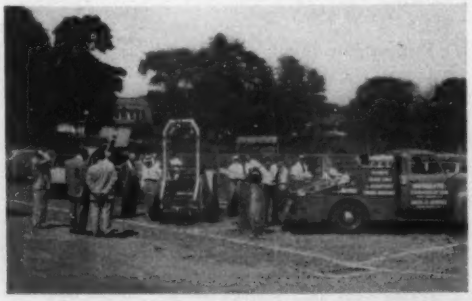
The way equipment is kept operating in Ridgewood was demonstrated at the maintenance garage. At the garage, also on exhibit, was a new hydraulic Rodgers' sweeper-broom winding machine. Ridgewood's fire-alarm system,

This TIFA fogger showed why so many cities now enjoy insect-free summers.

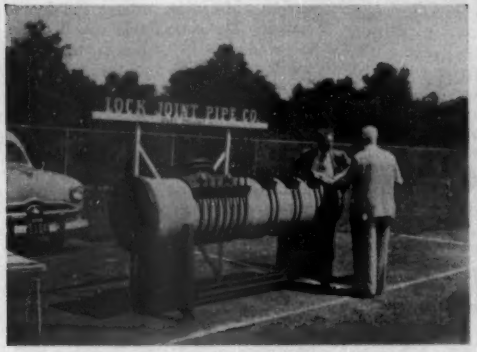
a 100% Gamewell installation with 130 boxes, also was examined by the visitors.

The sewage-treatment plant came in for special attention because of the new pilot plant, where tests are being com-

This shows why Ridgewood's parks stay green during dry weather. Aluminum pipe, couplings, and spray nozzles, easily assembled by one man, deliver 450 gpm of water at 100 psi with the help of a Marlow 4-inch centrifugal pump. The system is a product of the Irrigation Equip-



ment Company of Eugene, Ore. Above, right, the Homelite Corporation displayed power saws, generators, and pumps. The Champion Corporation showed new sewer-cleaning equipment. At the far left of the photo is the Mobile street-sweeper which was on hand for examination.



Two visitors get the full details on how Lock-Joint pipe can be tapped for connection with branching lines. At left is Charles Velzy, of Nussbaumer, Clarke, and Velzy, consulting engineers of Buffalo and New York City, and, right, Fred Welsch, Senior Engineer of the Nassau County (N. Y.) Department of Public Works. Above, right: only one man is required to load, haul, and dump when truck has been equipped with this Holmes-Owen self-loader.

pleted by the Infilco Company. This plant provides primary settling and the activated-sludge treatment in the same unit. Ridgewood plans to build such a unit sometime within the next several years.

Details of the meeting were handled by John Muller, Assistant Water Superintendent. Henry Leuning, Superintendent of Parks and Shade Trees, gave a short talk on shade-tree care. Water Department inspection was the responsibility of J. Arthur Carr, Superintendent. Maintenance-garage inspection and other details were arranged by City Engineer Robert Raymond and Motor Superintendent Chester Nickerson. Fire alarms were demonstrated by Charles Clare. John Hood, Superintendent of Sewage Treatment, showed how the new pilot plant gives aeration treatment.

The Marlow Pump Company, of Ridgewood, N. J., played host to the entire group for luncheon. At the evening dinner, Chapter President Ed Decher handed the presidential gavel to Ray Murphy, City Engineer of Rye, N. Y. E. Arthur Bell, Borough Engineer, of Essex Falls, N. J., became Vice-President.

Stockton, Kans., Builds Water and Sewer Lines

By HARLEY E. LUCAS
City Manager
Stockton, Kans.

NEW oil wells in the vicinity of Stockton were the reason for our water and sewerage construction. The building of new homes resulted from the oil wells, and new additions to our city, embracing these homes, thrust the responsibility for serving them on us.

The work entailed 16,000 feet of new sanitary-sewer extensions and 19,000 feet of new water-main extensions. The sanitary sewer was 8-inch vitrified-clay pipe. The water mains were 6-inch and 4-inch cast-iron pipe. The bid for the sewer project was $38,878. The contract for the water extensions was $48,845.

We required each bidder to submit with his proposal a certified check, a cashier's check, or an acceptable bidding bond in the amount of 5% of his total bid. This security was to serve as a guarantee that the bidder, if his proposal was accepted, would file all bonds required and enter into contract within 10 days after certification of the award.

Plans and specifications for either project could be obtained from our consulting engineers, Wilson & Company, of Salina, Kans., for $5 per set, half of which was refunded upon return of the documents in good condition within 15 days after the letting. The successful bidder was furnished three complete sets of plans and specifications, but any additional sets he might need were to be sold to him at cost by the engineers. The engineers received a percentage fee for the plans and specifications, and $400 per month while they have a resident engineer on the job.

Prior to acceptance and use by the city, the sewer extensions were inspected by an engineer in the Division of Sanitation of the State Board of Health, and the construction was approved before the line actually was put in service. The water-main extensions were all sterilized by strong doses of chlorine and flushed before receiving water.

The water-main extensions included 17 new fire hydrants supplied by the Mueller Company. The sewer extensions required 53 manholes. The minimum sewer grade was 0.40% and the maximum grade was 5%.

For cast-iron water pipe, the federal specifications WW-P-421 Class 150 applied for pipe 4 inches in diameter and larger. The American Cast Iron Pipe Company furnished this. The pipe is jointed with braided hemp and soft virgin lead. For the vitrified clay sewer pipe, A.S.T.M.C.-13 specification applied. The sewer joints were made with jute and sealed with a cold bituminous compound.

To enable the limited number of qualified plumbers and drain-layers to connect to the sewer extensions as soon as possible, we requested the State Board of Health to make a final inspection on a portion of the work as soon as a few blocks were laid and it was convenient for one of their engineers to make this inspection. Each time a section of the project was released for use, it was announced in the local paper. At the same time, precautions were stressed on venting and trapping, and an explanation made as to why it was necessary for the plumber or drain-layer to be bonded and approved by the city. We have a $3 charge for a sewer permit.

The sanitary-sewer extensions were financed entirely by special assessment, but the water-main extensions were financed by general-obligation bonds. The sewer project consisted of three benefit districts.

Stockton has the commission-manager form of government. C. H. Ostmeyer is Mayor; I. D. Wright and C. E. Hughes are the other Commissioners.

Diesel Saves $70,000 a Year

Harrisonburg, Va., cuts electricity-generating costs in diesel-steam-hydro system with diesel that burns the low-cost No. 5 fuel

By L. S. ARMENTROUT
Electric Department Superintendent
Harrisonburg, Va.

ONE 2,400-hp diesel is saving the City of Harrisonburg, Va., $70,000 a year over the cost of steam-generated electricity. The diesel is operating 24 hours a day and producing at the rate of 10,000,000 kw-hrs. a year. Burning an economical No. 5 fuel oil, its record has been so impressive that the City Council has voted to expand the diesel plant and abandon steam as a regular source of power.

Harrisonburg started municipal power production in 1904 when it converted an old flour-mill site into a hydroelectric station with a capacity of 200 kw. In 1914 a 240-kw vertical generator was installed which was followed three years later by an identical unit. The "hydro" plant was brought to its present capacity in 1930, with the addition of a third 300-kw generator. Harrisonburg has a population of 11,000. The plant serves 3,900 accounts.

Hydroelectric Capacity Exceeded

As early as 1922, it became apparent that the potential capacity of the existing hydro plant could not keep pace with the city's increasing power requirements. A steam plant with a 500-kw turbine was, therefore, put into service in 1923. Subsequent expansions included a 1,000-kw turbine in 1925, and a 2,000-kw turbine in 1937. Then the city made an exhaustive study to determine its long-range power policy. The two suggestions offered were modernization and expansion of the steam plant at a cost of $750,000, and construction of a diesel plant for $300,000. The city voted for diesel power.

Implementing the basic decisions, Harrisonburg purchased a 2,400-hp Nordberg diesel direct-connected to a 1,690-kw Westinghouse generator. The engine is a heavy-duty 2-cycle unit with 6 cylinders of 21½-inch bore and 29-inch stroke, developing its rated horsepower at a conservative 225 rpm. The diesel plant was integrated with the hydro station, located 10½ miles from town, to permit utilization of available labor and to insure an ample supply of cooling water. The existing transmission line was adequate and presented no problem.

The diesel was placed in operation in October 1949 and its work schedule was stepped up steadily until it reached 24 hours a day on February 8, 1950. Since that date, the unit has been operating continuously.

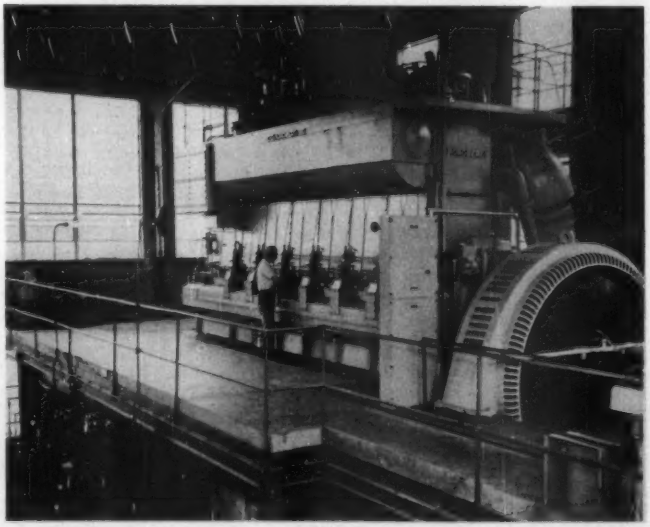
The anticipated economies of diesel operation have been fully realized. The total cost of producing a kilowatt-hour with the diesel averages 9.3 mills, including fuel, lube, labor, maintenance, supplies, insurance, interest, and depreciation. The comparable cost for the steam plant is 16.3 mills, for the hydro plant 3.1 mills. For the month of March of last year, the diesel cost was 8.7 mills per kw-hr.; and the steam cost a high 25.2 mills. However, a 16.3-mill figure for steam is fairer, since it would recognize that greater economies would be possible if the steam plant were to carry the entire load.

Using this conservative basis for comparison, a diesel output of 10,000,000 kw-hrs. means a net saving to the city of $70,000 a year. Obviously the hydro plant is the economy leader and is run at capacity all the time for an average production of 5,500,000 kw-hrs. a year. At current demand levels, there remain about 17,000,000 kw-hrs. for other power sources to provide.

In May 1950, the City Council voted to expand the diesel plant sufficiently to carry the full load (except for the hydro) and to retire the steam plant to standby service. Another Nordberg diesel engine was purchased and will be installed this year. This second diesel is a 6-cylinder unit with a 21½-inch bore and 31-inch stroke crosshead-type engine rated at 2,580 hp at 225 rpm. It will be direct-connected to a 1,825-kw generator with chain-driven exciter.

Engine Production

The engine produces over 13 kw-hrs. per gallon of fuel at 90% load, and an average of 12.50 kw-hrs. per gallon for the 24-hour run. The fuel used is a No. 5 oil with a viscosity of 262 seconds at 100° F., 19,000 BTU per pound, and



R. C. McInturff, Assistant Station Superintendent, checks one of the cylinder lubricators on the big new 2,400-hp diesel engine in the city's "hydro" plant.

7.68 pounds per gallon. Costs in this article were figured on a delivered fuel price of $0.0819 per gallon.

The heavy-duty Nordberg functions smoothly on the heavy fuel and there have been no adverse effects on the injection system. Of course, it is necessary to purify the oil before it reaches the engine. The diesel is started on No. 2 fuel, and switched to No. 5. For shutting down the engine No. 2 is used again.

Another project promises even greater operating economy. This includes a Nordberg "duafuel" engine capable of operating on natural gas with a small pilot charge of oil. At present there is no natural gas available in Harrisonburg, but there are gas wells in the region and a contemplated development program would make it available to this power plant. Dual-fuel operation would cut fuel costs substantially.

Power operations are directed and coordinated by the writer, as electric department superintendent, with H. C. McInturff as superintendent of the hydro-diesel station; R. C. McInturff as assistant station superintendent in charge of diesel operations, and J. L. Whitmire as steam superintendent. Major policy decisions are made by Mayor L. L. Loewner and the nine-man City Council. Specifically concerned with power problems is the council's electric committee consisting of M. R. Weaver, Chairman, S. J. Pritchard, and J. M. Warren. Management of the electric department is under the administrative supervision of City Manager S. W. Cotten.

How Los Angeles Washes Insulators

. . . *on energized high-voltage lines*

Specialized equipment allows insulators to be cleaned without de-energizing the line or endangering operators

By SAMUEL B. MORRIS
General Manager
Department of Water and Power
Los Angeles, Calif.

THE insulators on our high-voltage lines require special attention because of climatic conditions. The Los Angeles area has extended dry summer periods followed by heavy fogs. This results in the accumulation on line insulators of considerable dry dust, which forms a deposit that becomes conductive when moistened by the fogs.

For the past 20 years, the Department of Water and Power has been washing line insulators in place with high-pressure water streams to meet this maintenance problem. This washing is done periodically as required by weather conditions, and as dictated by experience on 34.5-, 115-, 138-, and 287.5-kilovolt lines in the metropolitan areas. We do not find it necessary to wash transmission lines in remote desert regions. All this washing is generally performed while the lines are energized.

Tests Show Safety

Washing under energized-line conditions was started only after tests demonstrated the complete safety and practicability of such a procedure. A set of thorough tests was made in our testing laboratory during 1942 by washing porcelain insulators on energized lines operating up to and including 138-kv. Tap water, under high pressure, having a resistivity in the order of 1,000 ohms per cubic centimeter was used, and results showed that the method was entirely safe.

It has been established that, in general, the average man will feel a current of 1 milliampere, that a current of 3 to 10 milliamperes begins to become disagreeable, that currents of 30 milliamperes may cause unconsciousness, and that currents of 100 milliamperes may be lethal. In the washing of insulators, of course, the washing nozzle is provided with a substantial ground connection so that any current flowing down the water stream bypasses the man holding the nozzle. If this by-pass connection is broken, practically the full nozzle stream current will pass through the man, as his body is paralleled only by the water column in the hose connection between the nozzle and the water pump. Upon the basis of the figures shown above, considering 5 milliamperes as the limit of current and providing a factor of safety of 5 for variation in water resistivity, the tests showed that washing of insulators serving 138-kv lines can be performed at distances up to about 15 feet from the energized parts. Following other tests made in 1946, the washing of energized lines was extended to 287.5-kv lines.

With this tank-and-ladder unit, popularly called an aerial laundry, the Department of Water and Power in Los Angeles keeps high-tension insulators clean and prevents electric-service interruption from flashover.

Water for the washing of insulators is obtained from the regular city fire hydrants, and the resistivity of the water is checked by means of a portable resistance meter provided with the washing truck.

Equipment and Its Pressure Capacity

To perform the cleaning operation, the department uses a 5-ton Autocar truck chassis with a hydraulically operated extension ladder manufactured by the Seagrave Corporation, of Columbus, Ohio. The entire unit was engineered and assembled by the Yankee Motor Bodies Corporation, 1224 East Olympic Boulevard, Los Angeles. The unit carries 900 gallons of water which can be discharged at a pressure of 1,000 pounds per square inch if necessary.

Less Work—*Moves More Snow*

Rock salt, together with fast-operating plows and a detailed program of operation, keeps Schenectady streets free of snow

By JOHN F. LUCEY
City Engineer
Schenectady, N. Y.

THE CREDIT, we suppose, really should go to Rochester. Last year we read the articles by Rochester's Commissioner Ed Nier that appeared in THE AMERICAN CITY, went over and saw how the program worked, and sold ourselves on a way to keep keep streets clear of snow. We are more than satisfied with the results, both in facilitating snow removal and in the reduction of the work required to clean streets and sewers at the end of the winter.

We have a real problem. Schenectady is an industrial city with 92,000 residents. It has two large industrial plants, that employ over 40,000 people, many from surrounding towns. One is the Schenectady works of the General Electric Company; the other is the American Locomotive Company, which manufactures diesel locomotives and tanks. The capacity of the G-E parking lot alone is over 8,000 spaces and that of American Locomotive is over 1,000. Schenectady's main street is also the main east-west truck route between Albany and Buffalo.

Plan Prepared

In order to provide for a free flow of traffic through the city and to and from these plants, our snow-removal forces must go into action promptly at the start of a snowfall. Last fall we prepared a plan to provide for the immediate dispatch of trucks with salt spreaders at the very outset of a storm. This action kept our main routes clear of snow in cases of very light falls and made plowing operations much more efficient when it was necessary to clear the snow from the streets. The use of salt and abrasives was continued on steep hills at heavily traveled intersections, and during extremely cold weather.

Four city-owned-and-operated Galion 101 graders were used in pairs to keep the main traffic arteries open. This year we have added a fifth, a Galion 103. Twenty privately owned trucks were equipped with city-owned plows and assigned to specific routes throughout the city. A street plan of each route, together with instructions, was posted in the cab of each of these plows. The instructions included general operating instructions applicable to all areas and special instructions covering conditions peculiar to each route.

This is a copy of the paper-bag sign used in Schenectady to notify would-be parkers that a street must be kept free for snow removal. The bag is put over the top of a parking meter.

Last winter we purchased 10 new plow assemblies to replace old units. Eight were Good Roads plows and two were Ross units. All are 11-foot, reversible blades, electrically controlled. The older plows that they replaced were 9-foot blades, electrically controlled. We rented trucks of at least 4-ton capacity at a straight-time rate of $4 per hour.

The assignment of specified areas to privately operated, truck-mounted snow plows eliminated many complaints which might have been caused by operators not familiar with the route.

All plows were started when the snowfall exceeded 2 inches, except at times when this point was reached just before peak traffic hours; in these cases the plowing was deferred until traffic was out of the way.

We have three Tarco Scotchman salt spreaders mounted on 4-ton Federal dump trucks. These trucks are used for street maintenance the rest of the year. We also remove our flusher bodies and spread abrasives with these trucks. This winter we plan to mount plows on salt and abrasive spreaders.

24-Hour Readiness

A three-shift organization was set up late in November to provide 24-hour readiness for snow-removal forces. This insured the prompt dispatch of salt spreaders and provided the forces to get snow-removal equipment prepared for operations. Privately owned plows were alerted upon receipt of information obtained from the Weather Bureau at the Albany-Schenectady airport. As soon as snow stopped falling, operations immediately began for the removal of snow completely from the downtown streets and from narrow streets in other parts of the city. Schedules of snow-removal operation were published in the local papers. A standard sign was designed with the caption, "No Parking—Snow Removal," to which a strip reading "after 3 p.m.," "after 6 p.m.," or "after 11 p.m.," could be stapled. Such signs were posted in advance, allowing parking up to the time when snow-removal forces moved in. In general, snow was removed from the downtown business area between 11 p.m. and 6 a.m. Snow was removed from the narrow streets and community-store shopping centers from 7 a.m. to 11 p.m.

Mechanical Loaders

In removing snow from the streets, the crews pulled the snow away from the curbs and plowed into windrows with a grader. Ordinarily, we used a fleet of five Sno-Gos to load trucks which hauled the snow to previously established dumping areas scattered over the city. For wet snow, we use a Nelson Loader; for extremely heavy snows, two

Snow-Removal Crews
Schenectady, N. Y.

General Operating Instructions

The following regulations are for your guidance, and strict adherence:

In the event of any trouble, which hampers the plowing operation, call the BU Service Office (2-3391) immediately.

Be sure that every intersection, on your route, is thoroughly opened before leaving the area.

Do not push snow onto a sidewalk.

Do not speed over your route, and especially so during a light snowfall.

Be sure and plow snow to the islands on streets having same.

Be sure and *PLOW ONLY* to the right at all other times.

Do not leave a street undone because of parked cars, or other obstacles. In the event that one or more obstacles interfered with early plowing, be sure and recheck streets so that same will be taken care of eventually. At the conclusion of a complete plowing operation, backtrack over your route to make certain that every street has been thoroughly plowed.

Be sure your lights are always in working order. Check them frequently.

In the event of an accident, and regardless of its nature, be sure and get all pertinent information.

Be sure your plow blade is properly adjusted at all times, and is riding on the pavement to thoroughly clear the snow. Check it frequently.

Be sure and hasten to your plow route when directed to do so by the BU Service Office.

Be sure that a sufficient number of cuts are made, on any one street, to insure a thorough clearance of snow.

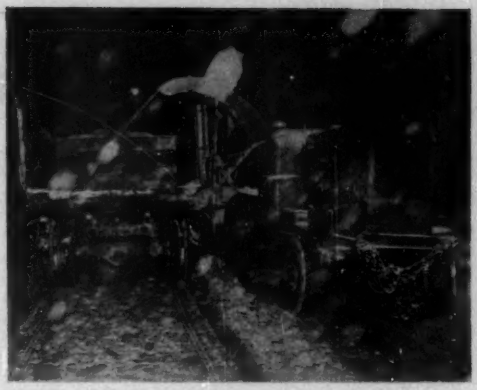
Do not loiter along your plow route for an unreasonable length of time.

No intoxication WHATSOEVER will be tolerated.

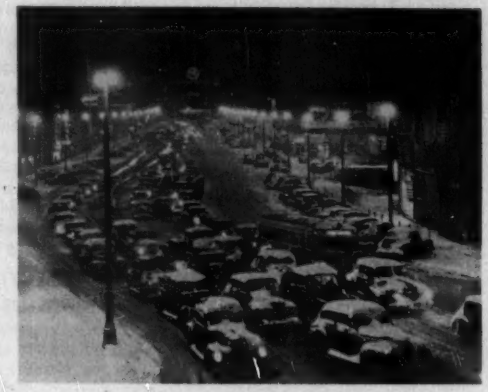
Follow all instructions carefully when given to you by an accredited representative of the BU Service Office.

Do not engage in an argument with any resident along your route. Report any difficulties, of an argumentative nature, to BU Service Office.

Instructions posted in the cab of each snow-plow truck.



This Sno-Go, above, is one means by which Schenectady copes with its snow problems. Below, the kind of traffic problem which confronts the city in bad weather.



Barber-Greene loaders were available. On parkway streets that have a narrow roadbed on either side of a mall, we plowed from the sidewalk to the mall and then used a Sno-Go to blow the snow onto the island.

Traffic to Industrial Plants Not Blocked

This plan of operations enabled the city to maintain free-flowing traffic to our main industrial plants with a minimum of interference all winter long. The first snowfall of the season, on Saturday the week before Christmas, was 9 inches deep and stopped at 4 a.m. With our forces going into operation in accordance with our prepared plan, all bus routes were opened and the downtown section enjoyed one of its busiest days despite the heavy snowfall.

Since last winter, mobile radio receivers were installed in the Superintendent of Service's car and in the emergency sewer truck. We plan also to install them in the City Engineer's car and in the abrasive spreaders.

The city has approximately 200 miles of streets. After every storm, all roads are broken through with at least one pass within six hours after snow stops falling, and are completely opened within 12 hours. The main business section was able to handle normal traffic with streets clear of snow from curb to curb within 48 hours of the end of each storm.

Our individual snowfalls only occasionally exceed 12 inches. The average yearly fall is 60 inches. We have had maximum individual falls of 24 inches and total accumulations of 100 inches.

Department Direction

Our snow-removal forces operate under the direct supervision of John Szumiloski, Superintendent of Service. He reports directly to the writer, who heads the Department of Engineering and Public Works.

University Planning Research Posts Open

SEVERAL research assistantships are available at the University of North Carolina for students holding undergraduate degrees in architecture, landscape architecture, or graphic arts who are interested in working toward a Master's Degree in the Department of City and Regional Planning.

The assistantships involve mapping and graphic presentation on a project for a defense agency. Two types of assistantships are offered: (1) one-third time on mapping assignment and two-thirds time on course work, with a stipend of $100 per month through May 31, 1952; and (2) two-thirds time on mapping assignment and one-third time on course work, with a stipend of $200 per month through May 31, 1952.

Inquiries should be addressed to John A. Parker, Chairman, Department of City and Regional Planning, University of North Carolina, Chapel Hill. The closing date for receipt of applications will be November 1, 1951.

Water-Works Countermeasures

What the municipal service should do to be prepared for atomic attack

IF A CITY suffers an attack by an atomic bomb, what happens to its water service? Considering the great tragedy of such a misfortune, worry about the water supply seems inconsequential. Yet considering how important this service is to the life of the community, the protection of this basic utility is paramount.

We have two case histories that indicates what happens—those of Nagasaki and Hiroshima, both subjected to a "model T" type of bomb. In each case, the report of what happened to the water service was simple and clear. Both were rendered almost totally inoperable. Not only were the distribution systems unable to deliver the quantities of water needed for fire fighting, but they also were polluted grossly by sewage and other contaminants.

But Nagasaki and Hiroshima were victims of surprise attacks. In neither city did anyone expect such an attack, nor did anyone know what to do if it came. At Hiroshima, 80,000 people lost their lives. Had Hiroshima's leaders known what to do, military authorities declare that at least half would have survived. Thus cities have grim reason for taking the time to be prepared.

What steps should a water service take to be prepared? These were spelled out in detail by Commander J. S. Marsh recently before the American Society of Civil Engineers' meeting in Houston. Commander Marsh is Officer in Charge at the U. S. Naval School at Port Hueneme, Calif.

He has a simple list of requirements. Many are useful to a water utility in any disaster-planning study, the atomic bomb being only one.

Maps

The first is that one should have maps of the distribution system. One set should be comprehensive, showing pictures of the entire water system. These will be useful to civilian-defense groups other than the water utility. It also will give guidance when indicating sections of the city that should be blocked off in event of conflagration.

The next set of maps that would be useful are large-scale sectional plats for use in making repairs. These should give details for increasing flow and rerouting water. The third set should show valve data. This should list completely all information about the valves —where they are, what they control, which way they should be turned to shut them off. Copies of these should be located in dispersed places so that they will not be destroyed.

Training Operators

The second requirement is a well-trained group of operators, both professional and volunteer. The water-works officials must know where they live and how to contact them quickly. These crews should know how to increase fire flows to disabled portions of the city, and should be skilled in isolating damaged sections of the water system and re-routing the water around it.

Plant Operation

The third requirement is that of adjusting routine water-plant operation to the requirements of an atomic attack. The first phase is the elimination of difficulties in plant operation, such as inadequate pumping capacity, inadequate filters or chlorinators, and lack of raw-water capacity or storage. The second phase would be the development of auxiliary sources of water. Water-works officials can wisely make definite arrangements, in writing, for these auxiliary supplies, be they industrial sources, new wells, or lakes used for other purposes. They also would show foresight by making periodic tests to learn what the sanitary quality of the auxiliary supplies is in case they are needed. The third phase would be that of developing an auxiliary source of power, and having that source in a safe location. Portable diesel or gasoline engines would, of course, be useful.

Distribution System

The fourth point of preparedness should be directed toward the distribution system. Today in particular, the well-prepared water utility should know where every valve is, what condition it is in, when it has been tested last, and whether the system has enough valves to sectionalize the system quickly and efficiently. It should also know where its hydrants are, and how they work. It should have a full complement of automatic cut-off valves in key places where reservoirs may fail and storage might be endangered. Its crews should conduct fire-flow tests on a regular schedule so that this important protective service will be at all times adequate.

Under today's conditions, emergency equipment appears vital. This should include not only pipe locators, repair equipment such as is normally stocked, but also test equipment to detect radiation contamination in the water along with other pollution that may occur. Also required will be portable or auxiliary equipment: contractors' well points, chlorinators, dewatering pumps.

Disaster Plan

The fifth important point is the disaster plan. Every city should have such a plan firmly established and placed in useful reserve. This should spell out a chain of command so that in all cases the one who should direct the authority is known. The plan will list trained people, able to perform specific tasks; it will take into consideration transportation of these people and communication systems for them.

The program should envision a long-range plan listing available water for fire protection, covered storage areas, the use of equipment able to operate at high speeds continuously with duplicate equipment available in segregated spots. It should spell out a program for pumping plants and filter plants to make them fireproof and bombproof, and equipped with splinter-proofing and blast walls.

Presumably, one must consider the possibility of the water system's being an outright failure. Thus, facilities should be provided to supply temporary water service, based on a figure of 2 to 5 gallons per capita per day. This requires tanks, containers, and tank trucks. The use of street flushers, properly cleaned and sterilized, offers a convenient method.

Finally, the water system should guard against sabotage, should have a loyalty check of some type for its oper-

ators, an identification system so that all would know that reliable operators were employed, and a protective system of fences and other guarding procedures so that key points will be protected.

The next question is that of knowing what to do during an attack. The greatest wisdom on the part of the waterworks repair crews apparently would be to get to as safe a spot as possible. The need for the repair crews will be great after the attack. They can perform no useful purpose prior to the time that the all-clear sounds.

Pattern of Attack

The pattern of other attacks discloses certain expected events. Primarily, the great danger will be from blast and not radiation. One should assume that elevated tanks will be destroyed in the same category as other structures. Those within one half mile of "ground zero" will probably be completely destroyed. Between a half and one mile the damage will be severe. Beyond eight miles, there should be little or no damage. Nevertheless, to be safe, the system will have to rely on direct pressure from pumping unless its reservoirs are on a hill in a protected position. Probably the distribution piping will survive without damage unless the ground is unconsolidated enough for the blast to produce ground settlement. In Nagasaki one length of 12-inch pipe did suffer damage when the ground was depressed as much as one foot in filled areas where compaction was not good.

The degree of survival of pumping stations and filter plants of course depends on how well the plant facilities were protected by blast walls and other methods. With attention, these ought to be able to resist damage.

The greatest potential loss of water apparently would be through damaged plumbing in the homes and buildings. And if this is widespread, the loss may be great. Therefore, all civilian-defense units would be wise if they were trained to shut off water quickly at the curb at damaged homes, and taught how damaged water-supply systems in plants might be isolated so that the loss of water would not be great. If this could be done quickly, the distribution system probably could supply water for fire fighting, and thereby aid immeasurably in its protection.

As nearly as can be determined, the bomb should not contaminate underground sources of water because the contaminants tend to adsorb to the soil. Even relatively shallow wells should be safe if surface drainage of contaminated material is prevented.

Those systems using surface supplies, and particularly open reservoirs, might be subject to radioactive pollution. This radiation probably will exhaust itself within a matter of days. Standard water-filter plants ought to be able to remove much of this polluting material since it will adsorb to suspended matter that the plants remove. Relatively simple tests should be able to disclose whether the treated water is dangerous.

If the water system draws from open reservoirs and supplies no treatment other than chlorination, then the tests should determine when the radioactivity has exhausted itself so that the water may be used for potable purposes. This period probably would not be long.

Before long, we can expect some standards as to what acceptable tolerances for radiation are. The common unit of measurement is the roentgen, symbolized by "r." It represents the amount of rays required to produce ions equivalent to one electro-static unit of charge in a cubic centimeter of air. It measures the amount of energy absorbed by material receiving radiation. Most believe that the 600-r exposure is lethal. A 50-r limit has been established by Dr. Stafford Warren at the School of Medicine at the University of California, and this limit is set over a 56-day period.

Presumably, civil defense crews could determine what product has become radioactive and how long this effect will persist. Commander Marsh reports that radioactive sodium, possibly resulting from an underwater burst, will have a "half-life" of 14.8 hours. In other words, every 14.8 hours, the radioactivity will be reduced by half. Radioactive chlorine, in contrast, has a "half-life" of 57 minutes, and therefore deteriorates much more quickly.

From this summary, it can be seen that the water system must fear most greatly the effect of blast, rather than that of radiation. Actually, the blast effect should not be as great as that suffered by many cities during the last war, since these attacks came from bombs, many of which penetrated the surface of the earth and actually broke the water mains and other utilities. The atomic bomb, in contrast, will be detonated from great height, and should damage pipes only in poor soil.

The water system should go to great lengths to protect its pumping stations and filter plants if an attack seems imminent. Its crews should keep themselves as well protected as possible, so that they can go to work rapidly after the attack is over. They should be familiar with radioactive detection devices so that they can determine whether the water is safe and potable. They should encourage all civilian-defense personnel to learn how curb stops work so that great loss of water will not be experienced in the distribution system.

Communications—Nerve Center of Civil Defense

Communications will play a vital role in the event of an enemy bombing attack on the production and metropolitan centers of the United States. This photo, from a movie entitled, "—And a Voice Shall Be Heard," filmed by the March of Time for the General Electric Company, shows a typical CD communications center in operation during an emergency. The movie had its premiere showing at a General Electric Civil Defense Conference for 200 state and city officials at Electronics Park, Syracuse, N. Y., on September 13.

Tampa Makes Sewage Treatment

By DONALD NEWTON, *Resident Engineer*
Greeley and Hansen, Consulting Engineers, Chicago, Ill.

TAMPA, Fla., is moving rapidly toward fullfilment of a 20-year goal by building a complete sewer system and sewage-treatment plant. This $12,000,000 improvement will give the city the largest such plant in Florida. The program includes a complete intercepting-sewer system, additional street sewers, and rehabilitation of some older sewers.

Plan for Financing

The project is unusual in that Tampa is one of a very few cities to finance its entire sewerage-expansion program, including both sewers and treatment works, entirely by means of revenue certificates. This plan of financing was developed jointly by the city's financial advisors, Lehman Brothers, and its legal advisors, Mitchell and Pershing. It was incorporated into the Tampa Sewer Revenue Bond Act of 1947, and the authorizing resolution approved by the city's legislative assembly in 1949. Under this financing plan, funds for construction are derived from sale of revenue certificates which are to be retired solely from the income derived from sewer-service charges made against all users of the sewer system, including all of the various city departments. The only additional security behind the bonds is the pledge of excess revenues of the municipally owned water works, which has financed most of its recent expansion program by sale of revenue certificates.

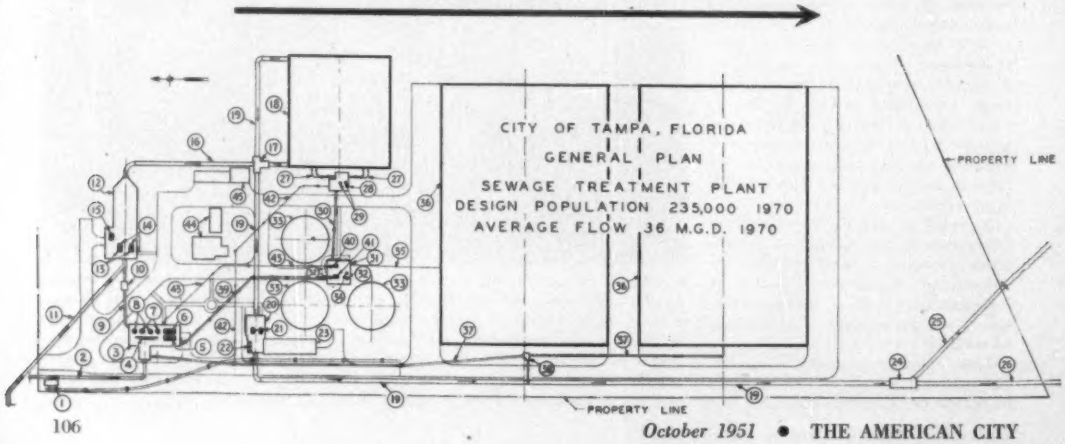
The preliminary report by the engineers in early 1948 was made jointly for the city and the Suburban Tampa Sanitary District, which comprises a marginal area of approximately 22,000 acres surrounding the city. The recommended project included provision for ultimate development to serve the city and the entire district with one treatment plant. Immediate construction was recommended of all elements in the city and in a densely developed area of the district lying on a peninsula to the southwest of the city, which is partially served by inadequate sewers and treatment facilities. Construction of the city portion of the over-all plan is rapidly nearing completion. The more difficult problems of financing the district project, including the greater proportion of street sewers, and the necessity of a favorable referendum vote, have, for the present, deferred the start of work on the suburban portions of the project.

Sewer-Service Charges

As previously mentioned, sewer-service charges are to provide the revenue required to operate and maintain the sewers, pumping stations, and treatment plant, and meet all debt-service requirements on the bonds. These service charges are to be based upon metered water use. The initial engineer's report included the results of a survey of records of the water department which indicated that a basic service charge equal to 100% of the water bill for the average residential-sewer user would provide adequate revenue. In addition to the basic charge, provision is made in the authorizing resolution for credit for water used, but not entering the sewers, a 10% discount for prompt payment of bills, and special charges for industrial wastes. Also, sewer users who connect to the new sewer improvements, or street sewers, pay a surcharge partially to defray the cost of construction of these sewer improvements. This is an equitable charge because the users of existing sewers have paid for the street sewers providing them with service through special benefit taxes and assessments. The surcharge is to amount to 35% of the water bill, including a 10% discount for prompt payment, or a minimum of $1 per month, and is to continue for a total of 240 monthly payments per connection.

Bond Sale

The authorizing resolution and validation proceedings of 1949 authorized the sale of the $13,000,000 of revenue certificates, equally divided between 35-year-term bonds and serial bonds, indicated as being necessary by the engineer's comprehensive report of October 1948. Provisions were made to permit the sale of additional certificates if necessary for completion. The sale of bonds in two groups was planned. Bids on approximately one-third of the construction were called for prior to the first sale, with contract awards to be deferred until completion of the bond sale. These bids were considerably below the engineer's estimates. The first sale, comprising $8,000,000 worth of bonds, was completed at an average interest rate of 3.24%. In June 1950,



a second group of bids was received which also ran below the estimates. With bids received on approximately two-thirds of the work, completion at an expenditure of $12,000,000 was indicated. The subsequent sales of the $4,000,000 of bonds required for completion was accomplished in September 1950 at an average interest rate of 2.65%.

All preliminary estimates of financing were based on an interest rate of 3.5%. The average interest rate of 3.02% that was actually obtained represents a saving of roughly $2,000,000 in cost of financing. When combined with the $1,000,000 reduction in the size of the issue, a $3,000,000 saving in the cost of the project is seen to have occurred.

This article concerns itself chiefly with the financial aspects of the project as a whole and a description, in detail, of the treatment plant. The sewer, pumping station, land, and subaqueous pipeline portions of the project constitute approximately 81% of the $9,460,000 total construction cost, and include 11 pumping and ejector stations and approximately 144.5 miles of sewers and pipelines, ranging in size from 6 inches to 78 inches in diameter.

New plant and sewerage system are financed entirely by revenue bonds paid out of sewer-service charges guaranteed by water-plant earnings

Plant Can Receive 36 mgd

The sewage-treatment plant is of the conventional primary-treatment type, and is designed for a tributary population of 235,000, anticipated in 1970. The average expected flow will be 36,000,000 gallons daily.

Sewage from the eastern portion of the city, amounting to approximately 30% of the total, reaches the plant through a 54-inch intercepting sewer and is pumped to the grit chamber. The remaining 70% of the sewage is pumped through a force main to the grit chamber from a pumping station in the downtown area. This 54-inch main has two 48-inch subaqueous sections passing under main ship channels.

3-Channel Grit Chamber

The grit-chamber structure consists of three channels and a building housing the screens and grit-washing equipment. One of the channels is used as a by-pass. The remaining two channels are each equipped with a Chain Belt mechanically cleaned bar screen and triturator for grinding screenings. Following the screens are the Jeffrey straight-line grit-collector mechanisms. Grit is washed in a jig-type grit washer and discharged into trucks for disposal as fill.

The sewage flows from the grit chamber to the sedimentation tanks through a 6-by-6-foot box conduit. The design provides a by-pass of the sedimentation tanks if necessary.

The four sedimentation tanks are rectangular, each tank equipped with two parallel Jeffrey straight-line sludge-collector mechanisms and a cross-collector. Baffled slot-inlets allow the sewage to enter the tanks without turbulence. Similarly, effluent is taken off by multiple weirs and effluent troughs.

The three sludge digesters are equipped with wood-decked steel Pacific Flush Tank floating covers with piping arranged to permit operation in parallel or series. Raw sludge is heated before discharge into the digesters in a Pacific Flush Tank heat exchanger, utilizing the waste heat in the jacket water from the gas engines. These engines use the digester gas for their primary source of power.

While sludge discharged to the drying beds will normally be by gravity, facilities for pumping to the beds also are available. Sludge-bed dikes are paved with a hand-stamped sand-asphalt surface.

Final Screening

The primary-tank effluent receives a final screening to remove remaining floating particles. Two Link-Belt traveling water screens, with ⅜-inch square openings, do the work as the sewage flows through the effluent building. Three Wallace and Tiernan chlorinators, each having a capacity of 6,000 pounds of chlorine per 24 hours, can apply the chlorine either at the influent of the pumping station for odor control or at the effluent building for disinfection. A detention time in excess of 15 minutes is available before discharge of the effluent at the end of the outfall. A covered chlorine-storage yard, adjacent to a railroad spur, provides storage for 44 one-ton cylinders.

The chlorinated effluent passes through an 84-inch-reinforced-concrete pipe to the shore overflow structure. A 72-inch reinforced-concrete pipe permits by-passing the outfall and discharges above water at the shore line. The 78-inch reinforced-concrete pipe

CITY OF TAMPA, FLORIDA • GENERAL PLAN • SEWAGE TREATMENT PLANT

LEGEND

1. TRANSFORMER SUB-STATION 13800V-460V.
2. 54"R.C. GRAVITY SEWER
3. PUMPING STATION
4. CONTROL BOARD
5. GAS ENGINE 345 H.P. - GENERATOR 235 K.W.
6. DUAL FUEL ENGINE 300 H.P. - GENERATOR 200 K.W.
7. PUMPS-16 M.G.D. EACH
8. PUMPS 8 M.G.D. EACH
9. 36"C.I. PIPE
10. VENTURI METER
11. 54"R.C. FORCE MAIN
12. GRIT CHAMBER, 3 CHANNELS 75'LONG × 12'WIDE 70'TO 93'W.D. - MECHANICALLY CLEANED
13. MECHANICAL SCREENS ¾" OPENINGS
14. TRITURATORS
15. GRIT WASHER
16. 6'× 6' SEWAGE CONDUIT
17. BY-PASS STRUCTURE
18. SEDIMENTATION TANKS 4-170'× 40'× 13'W.D. DETENTION-1.75 HRS. AT 36 M.G.D. MECHANICALLY CLEANED
19. 84"R.C. SEWER
20. EFFLUENT BUILDING
21. EFFLUENT SCREENS-⅜" SQ. OPENINGS
22. CHLORINATORS-3 AT 6,000 LBS. PER DAY
23. CHLORINE STORAGE YARD
24. SHORE OVERFLOW STRUCTURE
25. 72" OVERFLOW
26. 78" OUTFALL - 3,750' LENGTH
27. 8"C.I. SLUDGE DRAW-OFFS
28. SLUDGE PUMPING STATION
29. RAW SLUDGE PUMPS-100 G.P.M. EACH
30. 6"C.I. SLUDGE
31. SLUDGE CONTROL BUILDING
32. SLUDGE CIRCULATING PUMPS-400 G.P.M. EACH
33. SLUDGE DIGESTION TANKS 75'× 22.5' S.W.D. 113,330 C.F. EACH
34. DIGESTED SLUDGE PUMP 150 G.P.M.
35. 6"C.I. DIGESTED SLUDGE
36. SLUDGE DRYING BEDS-14 BEDS AT 125'× 50' AREA 87,500 SQ. FT. EACH GROUP
37. 18"V.C. DRAIN
38. OVERFLOW BOX
39. 2-6"JACKET WATER CIRCULATING LINES
40. JACKET WATER HEATER
41. SLUDGE HEAT EXCHANGER
42. 12"C.I. DRAIN
43. 6"C.I. GAS
44. ADMINISTRATION BUILDING
45. SHOP

outfall extends 3,750 feet into the bay, discharging at the edge of the main ship channel in water approximately 30 feet deep.

As mentioned previously, the plant uses the digester gas for power purposes through engines, housed in the plant pumping station, which are directly connected to generators supplying all plant-power needs. The largest power users are the four Fairbanks-Morse sewage pumps. The pumps are vertical, angle-flow units of the "built-together" type, having two bearings for each pump and motor unit. Two units are driven by constant-speed squirrel-cage motors while the other pair are driven by wound rotor motors providing variable speed control over a range from 80% to 100% of rated speed. The pumps are rated as follows:

Capacity	*Head*	*Speed*	*Motor hp.*
2 @ 8mgd	18 feet	579 rpm	30 variable speed
2 @ 16mgd	20 feet	500 rpm	75 constant speed

Coarse screens are located ahead of the pumps. Concrete suction conduits from the screen channels to the pumps eliminate the need of a suction well.

Sludge gas is to be utilized by two Worthington engines; one is designed for gas alone, and the other is a dual-fuel type. Both operate on gas at a pressure as low as 2 inches of water. A 200-kw generator is driven by the 5-cylinder, 300-hp, dual-fuel engine, and a 235-kw generator is driven by the 5-cyinder, 345-hp gas engine. Both generators operate at 450 rpm and provide 3-phase current at 460 volts. Standby power and power for clocks and metering equipment are obtained from the power company.

Independent Water Systems

There are two independent plant water systems, each serving related buildings, in which city water is used. The water is discharged into open-receiving pressure tanks. Controls operate the plant water-supply pumps which take water from the receiving tanks. These systems provide seal water for the centrifugal pumps, and also flushing water and process water where cross-connection hazards might exist. In addition, there is an effluent-water system furnishing water for cooling the engine-lubricating oil and engine-jacket water as well as for flushing the effluent screens.

Power

Underground cables transmit all power within the plant site. The main switchgear in the pumping station contains all generator controls, local motor controls, and control-circuit breakers on the power feeders to each individual building. All motors are to be operated on 440-volt, 3-phase current. Each building, except the pumping station, contains a room housing the motor-control center, lighting-system transformer, and lighting-panel board for that building. Yard lights are remotely controlled from the main switchgear with the operating relays located in the "electrical" rooms of the several buildings.

Interior wiring is exposed, except in the pumping station where the conduits above the main floor are concealed in the walls up to the crane-rail girders. Explosion-proof wiring, fixtures, and motors are used in all rooms over open-sewage channels and also in the sludge-control building.

In the center of the plant area is the administration building, containing office space and complete chemical and bacteriological laboratory facilities.

Plant structures are of concrete-block construction, with flat roofs, having built-up roofing over light-weight concrete roof slabs. Exteriors are white stucco. Wall-bearing construction is used in the smaller structures, while the larger buildings have structural steel frames. Corrosion-resistant materials, including stainless steel, bronze, and lead-coated copper, are used to the greatest extent possible.

Design of the sewage-treatment plant, pumping stations, intercepting sewers, and sewer improvements has been done by Greeley and Hansen of Chicago, Ill. Construction of the entire project is under the supervision of Greeley and Hansen, with John T. Walbridge as construction engineer, and the writer as resident engineer.

City officials active in initiating and carrying out the project include Curtis Hixon, Mayor; Karl E. Whitaker, City Attorney; Roy K. Van Camp, Superintendent of the Department of Public Works, and B. M. Duncan, Assistant Superintendent of the Department of Public Works.

Industry's Concern with Community Improvement and Higher Education

THE world has demonstrated that there will be no more social vacuums. People crave the good things of life, and they believe that American business does not want them to have those good things. If you want to give us a long shove down the road towards socialism, ignore the social problems of your community. But if you want to preserve the heritage of free enterprise, get in there and pitch, and make everybody in your organization pitch. Make your town the best town to live in, and you'll get the best workmen. Forget your town, let it decay, and you'll be strangled for good workmen, because today the working man is discriminating. He wants to bring up his children in a community where there are good schools, good churches, good recreational facilities, and a fine moral tone.

The same applies to education. Industry has come to the point where it is willing to support institutions for higher learning in the technical studies, but it has been very hesitant about lending its support to the liberal arts studies. Yet today, the problems that are plaguing industry are not those caused by inadequate technology. Possibly we have too much technology. The problems that are plaguing us today are not in the realm of facts, but of ideas and ideals, and those are tackled in the liberal arts institutions.

Now we have fine state universities throughout the country. Do you want every university to be state-controlled and state-financed? Isn't there a grave danger that evenutally government will direct the policy of teaching if every institution becomes publicly owned and publicly operated?

The state institutions are kept on the beam by the standards set by the privately endowed institutions; and those institutions cannot survive and maintain those high standards of free inquiry without help from the American business groups.

CLARENCE B. RANDALL, *President Inland Steel Company*

Excerpt from a talk given before a conference held in Chicago, June 1951, by the Chamber of Commerce of the United States, and reprinted in the *Atlantic Monthly* for September 1951.

Future Springfield, Inc. Gives Traffic Scholarship

FUTURE Springfield, Inc., the privately financed bureau of municipal research in Springfield, Mass., has offered tangible evidence of its active interest in the local traffic situation. The organization has given a scholarship in the Police Traffic Training Course of the Traffic Institute of Northwestern University to Springfield's Police Department. Traffic Safety Officer J. Albert Murphy has been named by Chief Raymond P. Gallagher as the recipient.

For several years Future Springfield has recommended that the city budget provide funds for special police traffic training, but each time funds for this purpose were not forthcoming. In consequence, the research group made the award from its own funds.

Public recognition of traffic-control problems in Springfield has been heightened recently by a series of pictures and articles about common traffic violations published as a public service by the *Springfield Daily News*. These have helped to drive home the need for traffic education and enforcement.

A Seal-Coat Street Saver

Winter-ravaged streets rehabilitated by emergency patching and extensive seal-coating program

By JAMES C. RYAN
Commissioner of Engineering
Youngstown, Ohio

EVERY community in the snow belt of Ohio was faced with a very expensive and serious problem in the spring of 1951. The record snowfall, plus the many freezing and thawing cycles, raised havoc with the previously laid plans and the previously made budgets for 1951 street maintenance. Programs had to be revised hastily and emergency requests placed before the City Council for additional appropriations.

In Youngstown, Ohio, patching with asphalt emulsion was started whenever weather conditions permitted, and the most dangerous chuck holes were eliminated temporarily by this method between snow storms. Meanwhile, the program was revamped so that the total budgeted amount of $175,000 was allotted to seal coating and an additional $135,000 was raised by councilmanic bonds for resurfacing. These appropriations permitted us to do about $1,250,000 square yards of seal coating and 145,000 square yards of resurfacing.

New Equipment Increases Efficiency and Speeds Work

All seal coating is done by city forces under the direction of Albert Peterson, Street Superintendent, who, through 35 years of experience in construction work, turns out what we consider to be work of the first order. We consider the work done in 1951 to be our best effort and this can be partially ascribed to the purchase of a new Littleford distributor and a new Burch aggregate spreader which permits better control of both tar and slag cover.

Fog Coat Helps Eliminate Dust Nuisance

Practically all of the bituminous material used for seal coating in 1951 consisted of grade RT9 tar. For single seal we used .25 gallons of tar and 15 to 18 pounds of No. 6 slag per square yard. For double seals we used .3 gallons of RT9 tar chipped with about 20 pounds of No. 46 slag for the base course and .25 gallons of RT9 chipped with 15 pounds of No. 6 for the surface course. After rolling a fog coat of RT9 was applied to control dust, and the street was closed to traffic for 12 hours wherever possible. The application of this fog coat has eliminated complaints about dust in the residential districts. The cost of this work has averaged approximately 9 cents per square yard for a single seal and 20 cents per square yard for a double seal.

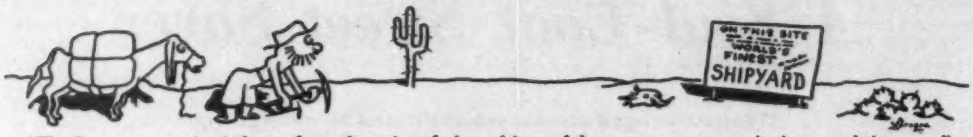
All resurfacing in 1951 was done by contract. We specified a special hot-mix top course, 1 inch thick, using only very fine aggregate in accordance with Pennsylvania State Highway Specification FJ-1 placed over a 1-inch base course of Ohio State Specification T-35. This bituminous concrete was manufactured and applied by the Kelley-Meyer Company, of Youngstown, Ohio, who were low bidders on the work. We are highly pleased with the results and have resurfacing that resembles sheet asphalt in appearance, but is more skid-proof and less expensive. The bid price was $9.20 per ton furnished and rolled in place. All manholes and valve boxes were raised either by city workmen or by the public utility affected. We have found that the best method for this operation is to break the pavement around the appurtenance ahead of the base course, and then raise the fixture to a point 1 inch above the base course so that it meets the top course.

Longer Life for Streets

We have found here in Youngstown that a single seal should be applied to a resurfaced street approximately at 5-year intervals, depending, of course, on the traffic carried. Our funds have not always permitted us to do this, but such a schedule, rigidly adhered to, will keep the streets in good condition for an extremely long time—if not indefinitely.

A Littleford distributor applies an asphalt seal coat to one of the residential streets in Youngstown, Ohio.

Following immediately behind the distributor is the Burch aggregate spreader to cover the asphalt with crushed rock.



"Weigh any prospective industry from the point of view of its usefulness to your community in normal times . . ."

Defense Industry for Your Town

It means prosperity today—but what about tomorrow?

By S. B. TOPF
Industrial Engineer
Cambria Heights, N. Y.

A PERIOD of national emergency, such as we are living in today, is a period of community emergency as well. It is a period in which many communities not only share the problems of the entire national community of which they are a part, but also find themselves faced with very special problems of a local character. The manner in which they tackle these local problems may well determine the future of their communities for a long time to come, as well as add or detract from the national-defense effort.

Probably the most characteristic problem peculiar to this emergency period is the question of industrial development: what kind and how much? Not so long ago most communities were going around begging for new industries. Now many of them find themselves high on the list of possible industrial sites, and the temptation is naturally very great to accept any and all opportunities which may be offered, without analyzing too closely. Yet just because this is an abnormal period, it behooves the responsible leaders of such communities to exercise caution.

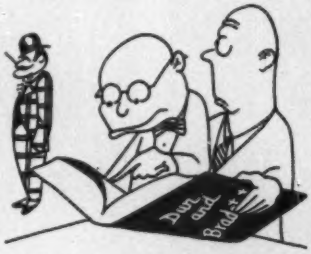
Weigh any prospective industry from the point of view of its usefulness to your community in normal times as well as in times such as these. When the emergency is over, will this industry disintegrate and carry your town with it, or will it stand on its own feet and thus be a bulwark to your abiding prosperity? The many ghost towns or bedraggled communities which were bursting at the seams with industrial activity at the height of World War II attest to the necessity for proceeding cautiously.

There is no doubt that a contractor can set up an establishment today to manufacture machinery in almost any part of the country, regardless of such items as power cost, transportation, costs of the raw materials and of the finished products, and all other factors which normally must be taken into account. This is not a competitive market; it is a sellers' market for defense industries, and ordinary standards of efficiency and economics may be ignored for the time. The industrial operator may seize the opportunity by the forelock, but it is the local community which may find itself scalped when competition resumes its sway over the economy, as it eventually must.

Questions to Consider

These are questions for responsible community leaders to consider: is the additional payroll an enduring asset to the community, or will it prove an embarrassment? Can you provide the needed personnel from your own citizenry, or will you attract labor from other localities; and if so, will you be able to house them and give them the living facilities needed? If you must increase your community's facilities, will this be the basis for sound post-emergency growth, or will you be left with acres of shanty-town when the bubble bursts? Similarly, consider your transportation, warehousing, and other accommodations in this light. It will almost certainly pay the prospective industrialist for you to outdo yourselves in providing for his emergency needs, but will he consider your requirements when the pace slackens?

An irresponsible contractor need not worry, just now, about meeting the price of a competitor who is 12 months behind on delivery; he can overlook a 10% or a 20% margin of excessive transportation costs in obtaining raw materials or delivering his product. When the time comes for him to be bothered by such matters, he will take his profits and, like the Arabs in the poem, silently steal away. What he leaves behind in the way of unusable plant, over-extended services, and displaced personnel will be your headache, not his.



". . . it behooves the responsible leaders of such communities to exercise caution . . ."

Nor does such a contractor need to worry about the fact that, because of the inefficiency of the setup, he may be wasting valuable or even critical transportation space, or in some other way hindering the defense effort more than he is helping it through production. In times of stress such things are always likely to be overlooked, and if the nation suffers, it takes nothing out of his pocket. Only alertness on the part of the community leaders can prevent or discourage the kind of unwise industrial mushrooming which may be temporarily profitable to an individual or a small group, but which is usually costly to the community and the nation.

Some Examples

You may think such things have not happened.

Here are a few examples out of my own experience.

One western community that wished to expand industrially lacked the basic requirements for large-scale industry; because of its geographical location it did not have an adequate supply, at economical rates, of raw materials and it was not near suitable markets. On the other hand, the economy of the region was ideal for the production of feed for livestock; cattle-raising was a major local activity, the raw material for feed was produced locally in abundance, and the community had a suitable natural site for the location of a feed mill. Yet the raw material was transported to a point 500 miles away for processing

into feed, then shipped 500 miles back for the use of the local cattle. Meanwhile the town fathers, hats in hand, went seeking industrial development, apparently unaware that the key to local prosperity was in their own pockets, so to say, and that by freeing 1,000 miles of transportation and supporting an efficient feed mill they would be aiding the defense effort materially and would be building in the bargain for the future stability of the community.

Another instance of poor judgment occurred in a southwestern town located in an area overcrowded with pulp mills. More than a dozen of these mills had already taken up every available option on timber land and had so cleaned out the local sources of supply that they had to ship in pulp wood from a distance of 350 miles to keep their mills operating, although the experience of mill operators has proved that any shipment of greater than 250 miles will cut the profit margin to the vanishing point. Yet under the guise of trying to pitch in and help the defense effort, the leaders of this town were actually trying to attract more pulp mills!

After analysis, it was found that the mills already in existence were importing, from a location 1,500 miles away, certain wood hubs required in their manufacturing process, for insertion in the center of paper rolls. Yet the hardwood out of which these hubs were made grew abundantly in that locality and, since this kind of wood was not

". . . ordinary standards of efficiency and economics may be ignored . . ."

suitable for the production of pulp, it was entirely available for industrial exploitation. In short, the sensible industry for that town was a plant manufacturing wood hubs for the pulp mills; and so the town was advised. Once more a local need was satisfied in a manner that could be maintained beyond the present abnormal period; local products not yet exploited were rendered useful for the first time; and our transportation system, which is a most sensitive and essential part of our economy during these times of national emergency, was freed from another unnecessary burden.

In still another sense the present emergency offers opportunities to those who are sufficiently alert to take advantage. Many expansion plans may appear doomed because they are not consistent with defense needs, or because materials will not be available in the predictable future. Construction material for many purposes, new sewerage, additional sources of water or power, may not be obtainable, and the funds raised for projects including these items may be allowed to lie idle for want of suitable use. If you permit this to happen, you will be missing the boat.

These funds should be applied to the development of special areas in or near your community which will become the industrial parks of the future. Now is the time to sow, in order that in later years you may reap prosperity. And I am convinced that those communities which have been forward-looking enough to prepare such industrial areas will be the most favored when the inevitable next period of expanded consumer production arrives. It is a great mistake to be so rapt with present conditions that future possibilities are entirely overlooked. If your community can invest its funds in sound defense projects, well and good. But defense projects which are unsound (and if they are unsound for your community, they are essentially unsound for the nation as a whole) should never take the place of healthy industry suited to your community, even if the actual establishment of such industry may require a little more time.

New Officers and Awards, American Public Works Association

EDWARD J. Cleary, Executive Director and Chief Engineer of the Ohio River Valley Sanitation Commission in Cincinnati, was named president of the American Public Works Association at its annual business meeting September 17 at Detroit's Veterans' Memorial building.

As president of the national organization of public-works officials, Mr. Cleary succeeds Milton Rosen, Commissioner of Public Works of St. Paul, Minn., who remains on the board of directors of the Association as immediate past-president.

Newly named area vice-presidents of the Association for two-year terms are Allan H. Rogers, Superintendent of Public Works in Garden City, N. Y., for the eastern region, and Milton Offner, Secretary of the Board of Public Works of Los Angeles, Calif., for the western area. Hold-over vice-presidents for the central and southern areas are George R. Thompson, City Engineer of Detroit, and Warren A. Coolidge, Director of Public Works in Nashville, Tenn.

J. J. Dean, Construction Superintendent in Albany, Ga., was named for a two-year post as director of the Association. Re-elected as director was Sol Ellenson, Director of Public Works in Newport News, Va. Continuing members of the board of directors are Ralph C. Graham, Superintendent of Construction and Public Works, Davenport, Iowa, and Ralph C. Taylor, Superintendent of the Waste Collection Division, Cincinnati. Edward P. Decher, Secretary and Purchasing Agent of the Joint Sewer Commission, Newark, N. J., was elected treasurer.

Award Winners

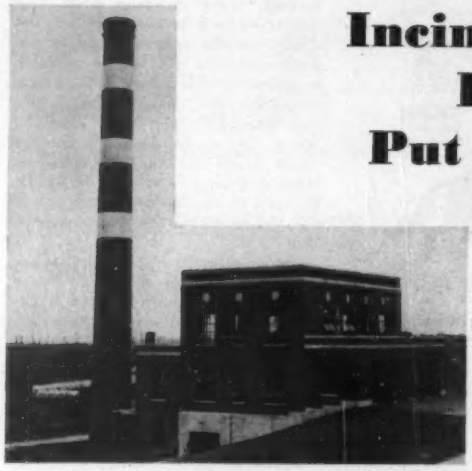
Fourteen public works officials received recognition for long and distinguished service in the field of public works and received the Samuel A. Greeley Award at the closing banquet of the 57th annual Public Works Congress and Equipment Show. Award winners were:

W. L. McFaul, City Engineer and Manager of Waterworks, Hamilton, Ontario; Guy C. Dewitt, Senior Engineer, Utica, N. Y.; Harold L. Andrus, Director of Public Works and City Engineer, Kalamazoo, Mich.; George H. Elliot, Jr., Associate Engineer, Baltimore, Md.; Morris M. Cohn, Public Health Engineer, Schenectady, N. Y.; Andrew F. Marsch, Assistant Engineer, Bureau of Streets and Electricity, Chicago; Eldred H. Walker, Associate Engineer, Rochester, N. Y.; Phil J. Diver, Superintendent of Public Works and Grounds, Marysville, Calif.; John S. Flockhart, Supervising Engineer, Bureau of Sanitation, and George W. Andreas, Engineer in Charge, Bureau of Streets, Newark, N. J.; Wendell R. LaDue, Superintendent and Chief Engineer, Bureau of Water and Sewerage, Akron, Ohio; Louis Schneider, Assistant Director of Public Works, Leo P. Gallen, Chief, Bureau of Street Cleaning, and Albert W. Moser, Associate Engineer of Design, City Plans Division, Philadelphia, Pa.

First recipient of the new Charles Walter Nichols award for outstanding achievements in the field of sanitation, was William A. Xanten, Superintendent, Division of Sanitation, Washington, D. C., in recognition of his consistent leadership over many years, "climaxed by the construction of a refuse transfer station incorporating a unique dust and odor control system." Honorable Mention was awarded to Nowlan M. Ulsch, Assistant Superintendent of the Department of Street Cleaning, Jacksonville, Fla., for his conception and production of a technicolor motion picture to promote cleaner streets in Jacksonville.

Incinerator Design Principles Put into Practice

Arlington County, Va., replaces a garbage dump with a modern incinerator using crane-and-bin refuse handling, batch burning, accurate temperature control, and means for sewage-sludge disposal



In the design of the Arlington incinerator advantage is taken of the natural slope of the building to eliminate the added expense of a ramp to the charging floor.

THE garbage dump at Arlington, Va., was probably the only one in the country to produce such a nuisance that it interfered with flying activities at a major airport. The dump, now replaced by a new incinerator, represented one of the irritating aftermaths of the tremendous population growth in Arlington County. Whereas in 1930, the county's population was only 30,000, it now has 145,000 within its borders. Today it has roughly 150 tons of refuse each day to dispose of. Arlington County actually is an urban area, using the county-manager form of government.

Burning Dump Dangerous

The incinerator has had an interesting history. Prior to 1946 the county depended on its open burning dump to dispose of its refuse. By careful burning the operators were able to reduce the volume by 75%. However, such burning always is dangerous. Periodic fires would break out and persist for several days, endangering adjoining property and causing clouds of dense smoke that hampered activities at nearby Washington's National Airport. So in 1946 the county undertook to eliminate this objectionable nuisance by building an incinerator. It drew on the services of Alexander Potter Associates, Consulting Engineers of New York City, to prepare the design and supervise the construction of the plant.

The receipt of bids and award of a contract for the construction of the plant sparked one of the most significant lawsuits in recent years in the refuse-disposal field. The specifications were carefully prepared to allow the manually stoked incinerator to compete against mechanically stoked furnaces. They included comparative evaluation of labor requirements for each type of furnace. Bidders were required to stipulate over-all labor needs.

At the time of the preparation of plans, only the Nichols Engineering and Research Company fabricated a mechanically stoked unit. When the bids were received, however, another company had offered the field a self-stoking furnace and placed the low bid based on its new furnace. However, on an evaluated basis, using the bidder's labor figures, the consulting engineer found the bid no longer low. Principally because of this, and giving some consideration to the experience of both firms, the consulting engineer recommended against acceptance of the bid submitted by this company. Subsequently, the award was challenged in the courts, but the Supreme Court of Virginia unanimously upheld the consulting engineer's opinion and recommendation.

Uses Crane-and-Bin Design

The plant is designed to crane-and-bid principles in order to reduce the plant size required. To burn Arlington's 150 tons of refuse daily, the plant has two mechanically stoked furnaces of 150-ton rated capacity (24-hour basis). The furnaces are actually operated on two 8-hour shifts. Refuse is deposited in the pit on an irregular schedule from the trucks over about six hours. The conventional floor-dump incinerator, if it were to receive and burn the refuse promptly, would have a required capacity of 600 tons per 24 hours instead of the 300 tons that the present plant uses. Thus, the storage bin and crane cut the required furnace capacity in half. In addition to its primary function of refuse incineration, the plant is designed so that at a later period a furnace can be installed that will burn vacuum-filtered sludge cake from the proposed enlarged sewage-treatment plant.

Receiving the Refuse

The incinerator receives most of its refuse between 8 a.m. and 2 p.m. County-owned trucks make deliveries from their regular collection routes until 6 p.m. All refuse received is weighed in a Fairbanks-Morse Type S truck scale and then delivered to the incinerator storage pit. The pit has a gross capacity of 25,000 cubic feet, or the equivalent of 200 to 300 tons of refuse, depending on its character. The tipping floor has four dumping stalls. A 3-ton P&H bridge crane with a 1½-yard Blaw-Knox bucket transfers the refuse to the furnaces.

The charging of refuse into each of the two furnaces is governed by specially designed Nichols charging gates. The charging operation is directed by the furnace operator's men from the operating floor who call for fresh loads in the furnace by flashing a signal light to the men on the charging floor. The charging, operating, and ash-funnel floors are also interconnected by an RCA two-way communication system.

No Preheater Needed

Preliminary studies by the engineer indicated that there would be no need to preheat the air used by the furnaces for combustion. The preheating operation, using waste heat from the combustion chamber, insures that the burn-

ing temperature will remain high and eliminates the need for auxiliary fuel. However, since the refuse has a conservative heat value of 7,000 BTU per pound, dry, the designers felt confident that there would be enough available heat and no preheater would be necessary. This has proved to be the case. Two Roots-Connorsville blowers, each of 14,000-cfm capacity and powered by a 15-hp 3-phase General Electric motor, supply the forced-draft air for combustion when necessary.

The furnace is batch-operated. The operator loads 15 buckets of refuse into the furnace and then blows it to "burn down." This takes from 45 minutes to one hour to load and an additional hour to burn. When completely burned down, the residue is dumped to a storage hopper, quenched, and subsequently removed by truck at the basement floor. Batch-charging insures thorough burning; however, the furnace temperatures rise and fall as each batch is charged and "burned down." The furnaces are designed to operate at an average temperature of 1,400° F. Operating temperatures are measured and recorded by Wheelco Capacilog pyrometers.

Future Needs Anticipated

The furnaces are equipped with means for future installation of auxiliary gas burners, if such should become necessary because of changed character of refuse. The gas supply will then be obtained from sludge-digestion operations at the sewage-treatment plant, thus again coordinating the two disposal services.

Fly ash is removed from the incinerator combustion chambers once a week by means of a Hoffco-Vac No. 5 portable industrial vacuum cleaner. This unit is also used to clean ceilings, walls, and floors of the plant by use of a vacuum-piping system extending to each floor.

Capacity

The furnaces are designed to provide a volumetric capacity of eight cubic feet per ton of refuse at rated capacity. The grates are designed to receive 83.3 pounds of refuse per square foot per hour. The combustion chambers provide 15 cubic feet of volume per ton of refuse. An expansion chamber is provided wherein gas velocities are reduced to 12 feet per second, thus allowing most of the fly ash to drop out. The incinerator stack is 150 feet high above grate-level and is marked with special branded markings and obstruction lights to warn approaching aircraft in accordance with CAA requirements.

The incinerator residue is removed to the near-by dump that had been used prior to the construction of the plant. Due to the inert, well-burned condition of the residue, it causes no nuisance or health problem. Moreover, its volume is reduced further by a metal-salvage program conducted by a contractor on the site. The contractor, licensed by the county, uses a crane with a magnet attached that drops the magnet on the residue, picking up the metal. This is then removed and baled for shipment to the steel mills.

The incinerator operation has required electric energy for operation and lighting as shown in the following table:

Month (1951)	*Refuse Burned*	*Power Used*	*Per Ton of Refuse*
February	2770 tons	8320 kw-hrs.	3.01 kw-hrs.
March	3041 "	8240 "	2.71 "
April	3290 "	7120 "	2.17 "
May	3711 "	7360 "	1.99 "

Of interest is the fact that even though the load on the incinerator became greater, the power used has decreased as the operators gain skill in firing the furnaces and operating the crane. At present, much of the time, the blowers are not needed to maintain good combustion in the furnaces.

Personnel

The incinerator operates as part of the administrative duties of the Arlington County Board, and is the immediate responsibility of A. T. Lundberg, County Manager; R. M. Wirt, Director of Public Service, and F. Harry Doe, Jr., County Sanitary Engineer. Alexander Potter Associates were responsible for preparation of plans and supervision of construction, with Walter P. Cain of that company serving as resident engineer.

The entire project cost $633,200, which included an item of $74,000 for paving, grading, drainage, and seeding.

Two furnaces burn refuse in two shifts. The space in the foreground can accommodate a third, if it is needed.

A truck takes refuse from the ash hoppers. Chute, left, leads to hopper that removes metal pulled from furnace.

Federal Aids Are Available For Critical Defense Housing Areas

CITIES confronted with a housing shortage created by the defense program can look to the Federal Government for assistance in solving their problem. Congress has provided the means in the Defense Housing and Community Facilities and Services Act which it passed recently.

As the name of the Act implies, the special housing aids provided are for defense housing; and the law is very specific as to what constitutes defense housing. It is housing that is programmed and built in areas which the President designates to be critical defense-housing areas.

Conditions for "Critical" Designation

In order to qualify as a critical defense-housing area, all of the following conditions must be found to exist:

1. A new defense plant or installation has been or is to be provided, or an existing one reactivated or its operation substantially expanded.

2. Substantial in-migration of defense workers or military personnel is required to carry out activities at such defense plant or installation.

3. A substantial shortage of housing for such defense workers or military personnel exists or impends which impedes or threatens to impede activities at such plant or installation; or that community facilities or services required for such defense workers or military personnel are not available or are insufficient, or both, as the case may be.

Upon designation of an area as a critical defense-housing area, a specific number of houses are programmed for the area, with a breakdown as to number of rental and sales units and as to size (by number of bedrooms) and maximum rental or sales price. Credit restrictions are suspended as to the housing to be sold at $12,000 or less per unit or to be rented at $85 or less per unit per month. As to all other housing in the area, credit restrictions will be relaxed in such a manner and to such an extent as the President determines to be necessary and appropriate to obtain production of the proper housing.

It is expected that the bulk of the housing to be built in defense areas will be private housing. Public housing will be called on to do the job only if and when private housing is not provided. To assure that private industry is afforded full opportunity to provide the needed defense housing, Congress provided that before public housing can be built, a number of requirements must be met.

First, the Housing and Home Finance Agency must publicly announce and print in the Federal Register the number, types, rentals, and general locations of the permanent dwelling units needed in each area designated as a critical defense-housing area for defense workers and military personnel.

Second, residential credit controls must be suspended on houses selling for $12,000 or less, or renting for $85 a month or less, and relaxed for other needed housing.

Third, new FHA mortgage insurance terms as provided by the Act must be made available to private builders or sponsors. These terms are more liberal than the usual FHA insurance terms on rental housing. For one thing, a builder or sponsor of multi-unit rental property may borrow up to 90% of the value of the property under the new Title IX insurance terms instead, for example, of the maximum of 83.3% for a $9,000 house under Title II insurance.

Fourth, private builders or sponsors must be given at least 90 days from the time public announcement is made of the availability of the new mortgage insurance aids to indicate that they will provide the housing needed. Indications will be gauged by the number of bona fide applications for exceptions from credit restrictions or mortgage insurance filed with the appropriate FHA office.

Permanent Public Housing

It is only after all four of these requirements have been complied with, and the needed defense housing has not been assured by private builders, that the Federal Government will be permitted to build permanent public housing.

Such permanent public housing shall consist of one-to-four-family structures, so arranged that they may be sold separately to private owners. The housing must be sold as quickly as possible, taking into consideration the need for housing for defense workers. Occupants and veterans will be given a preference in the purchase of this housing when sold. Projects not suitable for separate sale must be sold as entities, with first preference to veterans' groups organized on a mutual ownership or cooperative basis.

Where the need for defense housing is purely temporary, the Act authorizes the Federal Government to provide temporary housing. Such housing must be mobile or portable or otherwise constructed so that it may be reused elsewhere to meet other purely temporary needs. The four requirements which must be met before permanent public housing can be built do not apply to temporary housing.

The Act authorizes the appropriation of $50,000,000 for the public housing part of the defense housing program, including both temporary and permanent public housing.

Aid for Local Public Works

Assistance is also provided in the Act for communities which find that new or expanded defense activities have made inadequate their existing community facilities (such as waterworks, sewers, sewage, police and fire protection facilities) and community services (such as the maintenance and operation of facilities for health, refuse disposal, sewage treatment, etc.) The Act authorizes the appropriation of $60,000,000 for this purpose. However, loans or grants from this fund can be made only upon a showing by communities that they cannot provide these needed community facilities and services out of their own local funds. The Act permits the Federal Government to provide, operate, and maintain community facilities and services in cases where the local government is unable to do so with its own funds or with loans and grants provided by the Act.

Since private housing is stressed, the Act authorizes by far the largest sum of money for that large segment of the defense housing program. It provides for an additional authorization of $1,500,000,000 for FHA mortgage insurance—not only for the new and more liberal Title IX insurance but also for previous titles of the National Housing

Act, except Title VI, which has expired.

The test for insurance under the new Title IX is more liberal than under the permanent Title II program. FHA is permitted to insure on the basis of "acceptable risk" in view of the needs of national defense, whereas under Title II it is governed by the "economic soundness" of the loan. This means that in insuring home mortgages under Title IX, the FHA is not required to be limited by the long-term absorptive capacity of the market. In other words, if there is a shortage of housing for defense workers or military personnel, the FHA may insure the mortgages even though it may not be positive that they will need that number of homes when the emergency is over. The "economic soundness" requirement was a limiting factor in programming defense housing in many of the 40 areas designated as critical defense areas prior to enactment of the defense housing bill.

Under the new Title IX, FHA is authorized to insure mortgages both on one- and two-family houses and on multi-family rental housing. The one- and two-family houses are required to be held for rent for defense workers and military personnel for such a period as the FHA Commissioner may prescribe.

Mortgage Insurance

In the case of one-and two-family houses, mortgages may be insured up to 90% of the FHA appraised value, with maximum mortgage of $8,100 for a single-family unit and up to $15,000 for a two-family unit. However, in high-cost areas as determined by the FHA Commissioner, these maximums may be increased to $9,000 and $16,000 respectively. An additional mortgage amount of $1,080 may be allowed for a third bedroom and the same for a fourth bedroom unit. The loan may run for 30 years, with a maximum interest rate of 4½%.

In the case of multi-family rental housing built under the new Title IX, the mortgage may be insured up to 90% of the estimated value of the completed project. The maximum mortgage amount is $8,100 for units containing four or more rooms and $7,200 for units containing fewer than four rooms, with an additional $900 per unit allowed in high-cost areas.

As a further aid, the Act authorizes the Federal National Mortgage Association to make advance commitments for the purchase of mortgages on programmed housing in critical defense-housing areas, Wherry Act housing, and housing for victims of floods or other disasters. This commitment is limited to $200,000,000 at any one time and to commitments made prior to December 31, 1951.

In addition to the aforementioned aids for critical defense-housing areas, the Act also relaxes credit restrictions for housing outside such designated areas.

Lansing Owns 12½ Miles of River Banks

OF THE 18 lineal miles of banks of our three rivers, about 12½ miles now belong to the city. The Fire Department, the Water and Electric Light Department, and the Department of Public Service share ownership of these 12½ miles with the Park Department.

All departments have been interested in maintaining clean banks, well planted with native trees and shrubs. All of the banks controlled by our Park Department are wooded. Three and one-half miles are bordered by well-kept drives, while the remaining area is bordered by fine, heavily used parks and two municipal golf courses.

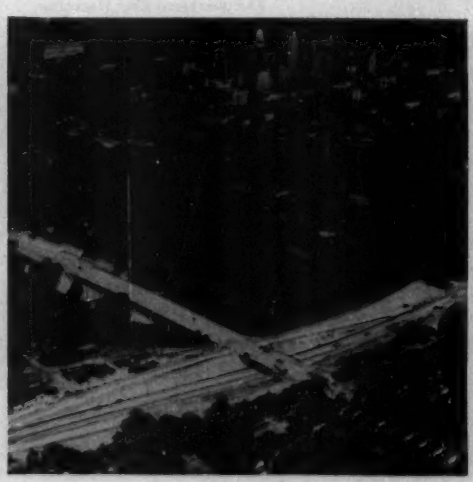
We consider, therefore, that all city-owned banks, whether viewed from Lansing's bridges, from street-ends, or from well-developed parks, are of exceptionally high recreational use and value. The photographs below show the appearance of some of our banks.

The acquisition of river-bank areas is a continuing activity, and we hope eventually to own, beautify, and maintain all 18 miles of waterfront.

H. Lee Bancroft
Superintendent of Parks
Lansing, Mich.

TOM TRYON, STATE JOURNAL

Water skiing on the Grand River at Frances Park.



ABRAMS AERIAL SURVEY CORP., LANSING, MICH.

A view of Lansing's downtown area and the Grand River.

Laid in Bellefontaine, Ohio, more than a half century ago, this "experimental" pavement is still serviceable.

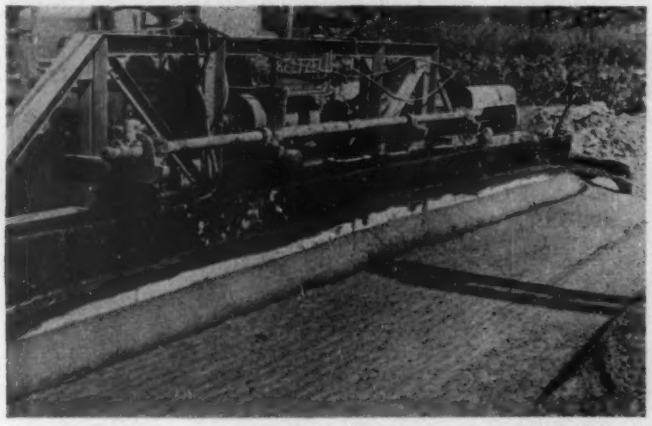
Pavements only five inches thick when laid over good subgrade have proved to be successful in residential areas.

SOME ELEMENTS OF

Street Construction and Maintenance

Part II—Concrete Pavements

By WILLIAM S. FOSTER
Engineering Editor
The American City Magazine



Air-entraining cement provides a concrete that is proving to be resistant to scale and weathering damage. Note "rubbery" appearance of concrete when mixed.

WHEN a city makes a permanent, all-weather street improvement, it uses either a rigid slab, generally of portland cement concrete, or some type of flexible pavement. Much controversy exists over which is better. Both, when built wisely, will give fine service. The proper choice depends on the availability of local materials, and the financial restrictions under which the city must operate. If one can risk a generalization, he can say that the rigid pavement costs more to build but requires less annual maintenance. Since annual maintenance is a cost met by a city's general fund, many prefer concrete because its original cost will be met by the property owners.

For the record, it is just as well to note, however, that the flexible-type pavement can be built that doesn't require high annual maintenance costs; and an engineer can, if he puts his mind to it, build either a rigid or flexible pavement weak enough and poorly enough so that maintenance crews will be constantly at work and the maintenance budget will be staggeringly heavy. However, we plan to avoid discussing this latter type of construction. Too much of it exists already.

First Concrete Pavement

The use of concrete for street paving is now well into its second half century. Bellefontaine, Ohio, laid the first such street paving, and is still using it. However, the city fathers laid it not to accommodate buggy and wagon traffic, but to protect the street from the pawing of spirited horses. These horses, hitched to posts at the city square, would quickly kick the existing macadam to pieces. The original slab was laid in the hitching-post area only. A few years later the city paved the entire square.[1] Watertown, N. Y., followed Bellefontaine's lead in 1894; Richmond, Ind., in 1896, and Detroit in 1889.

Concrete laid in pavements is subject to stresses from the weather. In the heat of summer, the surface of the pavement may reach temperatures as high as 120°F, while the temperature at the bottom of the pavement may go no higher than about 95°F. The Minnesota Highway Department has found a maximum differential between the top of a pavement and the bottom of about 25°F. in a 7-inch slab. This temperature range is one of the reasons that the surface of the concrete will break into sections. Engineers in the past have tried to control these breaks by the use of expansion and contraction joints.

Viewpoint Changes

However, engineering thought on expansion and contraction joints has changed greatly during the last quarter of a century. Ten years ago, and in many places even today, the preferred design called for an expansion joint about 1 inch thick every 90 to 100 feet, and a contraction joint every 30 to 50 feet. The design also required some sort of load-transfer device in these expansion and contraction joints, such as 1-inch dowel bars spaced about a foot apart. These dowel bars generally required specially designed sleeves so that the concrete would be allowed to expand, and they had to be greased or painted so that the concrete would not bond to them. The load-transfer devices are expensive, and the expansion joints never produced a pavement that was particularly satisfactory to the motorist. The familiar "thump-thump" of the tires on the expansion joint has always been annoying.

These designs were based on the theory that concrete would stretch and shrink with the temperature like a huge flat snake. Expansion joints were thought to be as vital as a safety valve on a steam boiler. However, studies of concrete-pavement expansion and contraction have changed the designer's thinking.

Representative of this are the conclusions recorded by the Minnesota Department of Highways based on observations of an expermintal pavement constructed in 1940. For rural highways, under Minnesota traffic and climatic conditions, these conclusions are:

1. Expansion joints do not appear to be necessary; in fact, their omission appears to be beneficial in preventing the development of undesirably wide openings in adjacent construction joints. Expansion joints are considered necessary adjacent to bridges and other fixed structures.

2. Short panels, around 15 feet long, are desirable because they provide a reduction in the width of individual joint opening, warping stresses, and immediate cracking.

3. Under Minnesota traffic conditions load-transfer dowels do not appear to be necessary in dummy-type contraction joints when expansion joints are omitted. A substantial increase in weight and number of axle loads may modify this conclusion.

4. No damage to the pavement because of serious compressive stresses has been observed in the pavements built in recent years without expansion joints. The indicated compressive stress is about 15% of the ultimate compressive strength.

H. C. Coons, Deputy Commissioner and Chief Engineer of the Michigan State Department of Highways, carries this analysis further by advising that:

1. The best way to form a contraction joint is to groove the pavement surface and place a metal plate in the bottom.

2. Joint-sealing compounds of asphalt and rubber appear best able to protect the pavement against intrusion of dirt and other incompressible material. Be warned that this material requires thermostatically controlled double boilers for heating.[3]

In some cases there has been sucessful use of a carborundum saw to cut the contraction joints after the paving has been completed. This avoids the annoyance of having to set the metal strips and the risk of having them knocked over when the concrete is poured.

Of course, many are familiar with the pavement "blow-up" that occurs frequently and often with a dramatic explosion. We are familiar also with the sight of a sidewalk pushing through a curb at the intersection of a street. These effects, however, are cumulative. The concrete does expand, and then contract slightly, and the cracks or contraction joints open so that dirt and sand can get in. When the heat of the summer forces them to expand, the cracks cannot close, and the compressive stress increases over that normally induced by temperature alone.

If the pavement is built without expansion joints and is supplied with dummy joints at 15- to 20-foot intervals, the joints will open only slightly so that there is less opportunity for incompressible sand and dirt to enter.

E. H. Hennings, Engineer of the Highway and Municipal Bureau, Portland Cement Association, has outlined certain elements of pavement design that will be helpful.[3] These are the following:

1. When the loads on concrete do not exceed 50% of the modulus of rupture, the concrete will withstand an unlimited number of stress repetitions.

2. The steel in concrete pavement is not used to increase the strength of the concrete, nor to prevent cracking, but to hold together cracks that develop, thus insuring full load transference across the crack.

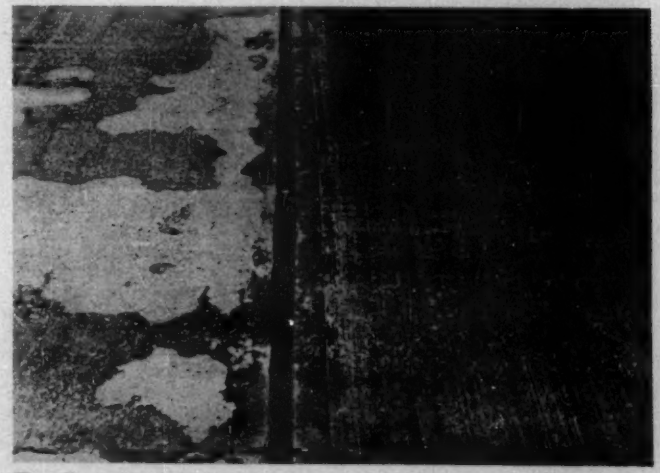
3. If joints are spaced to control cracking, no steel is required. The joint spacing should be according to the type of aggregate used, as follows:

Aggregate	*Spacing*
Crushed granite	25 feet
Crushed limestone or crushed gravel	20 feet
Small sizes of gravel or slag	15 feet

4. A ¾-inch expansion joint at each side of an intersection or at 600-foot intervals would be considered acceptable if the designer feels that he would like expansion space supplied. No more frequent use of expansion joints is needed.

5. Load-transfer devices should be supplied at expansion joints but not at contraction joints except at those joints close to the expansion joint. Probably two joints on each side of the expansion joint should be enough.

A further explanation of how con-



The effect of air-entrainment is depicted in this illustration. On the left is standard concrete; on the right is concrete made from air-entraining cement.

crete acts while in use comes from N. C. McCorkle, Assistant Design Engineer, California Division of Highways. He summarizes them as follows:

1. Concrete pavements tend to decrease slightly in length as they age.
2. Concrete pavements tend to curl more than to shrink, and this produces cracks that have been misnamed "contraction joints." Actually, they are caused more by warping than by contraction.[4]

Concrete Curing

Concrete, to retain any of its great natural strength, must be cured properly. In order for the cement to go through its transformation from a powder to a homogenous solid, water must be present. If the water evaporates, the top layer of concrete loses strength and it loses it where the pavement is subject to greatest wear and abrasion.

The engineer has several methods available to provide this curing. Pounding, of course, is excellent. However, it is practical only on level pavement surfaces and requires great supervision. Constant sprinkling for at least three days also is effective, but requires much water and labor. Covering the concrete with moist earth gives fine results, but requires a lot of earth moving.

Today, we have methods that give no better results, but do the work much more efficiently. One is to cover the pavement surface with an impervious layer of paper that seals the surface and retains the moisture. This, of course, requires care on windy days. To the pavement surface other products can be applied such as sodium silicate, various asphalt sprays, and clear or colored membranes that are designed to prevent the escape of moisture. Pigmented (white) membranes have recently come into use and have been shown to result in less temperature stress and, therefore, less cracking of the pavement at early ages before the concrete has developed strength to resist the stresses. For the same reason, black membranes such as asphalt sprays accentuate the temperature range and result in increased cracking. To avoid this effect, black membranes are often given an immediate coat of whitewash.

Air-Entraining Cement

One of the most consequential improvements in cement manufacture in recent years has been the use of air-entraining cement. By the use of certain admixtures, the cement mortar becomes somewhat more thick and pasty and provides a tougher weathering surface. The resulting concrete has these characteristics:

Improved weather resistance
Resistance to damage by chlorides used for ice control
Lower weight per cubic foot by three to six pounds
Lower flexural strength, perhaps 10% to 15%, although the loss is often less
Improved workability
Improved mix without segregation or bleeding

To use this cement in concrete, the Portland Cement Association recommends reducing the batch weight of sand by about 3% and water about ¼ gallon per sack for a trial. To finish the concrete, the finishing machine should be set for six to eight oscillations per foot. The concrete should be finished with steel floats. All finishing should follow the spreading closely.[5] The amount of air entrained should be between 3% and 6% of the volume of concrete for most paving mixes. Less than 3% will not insure satisfactory resistance to action of chlorides, and more than 6% will cause unnecessary loss of strength without giving any further protection.

If air-entraining portland cement is not available, or if the engineer prefers to use another method, the same effect may be obtained with ordinary portland cement by adding an air-entraining agent at the mixer. Several satisfactory agents are available, but their use should be most carefully supervised to be sure that the resulting air content is within the recommended limits.

When high early strength is required, the customary practice is to use a type of cement designed for this purpose. A.S.T.M. Type 3 cement is the general specification. High early strength can also be produced by the use of a richer mixture of ordinary portland cement. In addition, there are still many instances of good high-early strength results by using 2% calcium chloride per bag of cement as an admixture.

The thickness of paving slabs used in city streets is another point of frequent argument. Certain formulas exist that are helpful in calculating thickness, but these must take a secondary role to experience. On a good sub-grade, City Engineer William Chadwick, of Racine, Wis., uses this schedule for concrete pavement thicknesses:[6]

Residential	6 inches
Light commercial	7 inches
Industrial or bus routes	8 inches
Heavy duty	9 inches

Many feel that these figures are conservative. The Portland Cement Association has records of many concrete pavements in residential areas 5 inches thick that have served well for many years. With firm, well-drained subgrades, these thinner pavements apparently stand up well.

Dearborn, Mich., is typical of those cities that have incorporated modern design principles into paving specifications.[7] This city eliminated steel from concrete paving and pushed the expansion joints to 600 feet, placed contraction joints at 15-foot intervals, and used a section 6 inches thick for ordinary traffic, and 7 inches thick for bus routes. To keep the sidewalk from pushing through the curb, the design calls for a notch in the curb for the sidewalk to rest on. Fred Storrer, Dearborn consulting engineer, adopted these principles when he was City Engineer.

Wyandotte, Mich., has used a similar design.[10] F. W. Liddle, when he was City Engineer of Wyandotte, was not afraid to use a 5-inch slab. His calculations showed that a concrete paving with a thickened edge equivalent to a 7-5-7-inch section on a subgrade able to support 20 pounds per square inch will take:

7,000-pound wheel load — indefinitely
8,000-pound wheel load — for 35,000 repetitions, or 1,400 per year for 25 years
9,000-pound wheel load—for 12,300 repetitions, or 492 per year for 25 years.

In his work, the integral curb, built as the rest of the slab was laid, produces the equivalent of the 7-inch edge thickness. Mr. Liddle recommends expansion joints only where a change of grade occurs near the 600-foot interval or at each intersection.

Conclusion

From this discussion, we begin to see that engineers have re-analyzed the stresses placed on concrete pavements by the weather, and have been able to revise their designs and lower the cost of the pavements. They have discovered also that concrete laid on good subgrade need not be excessively thick. This means more pavement per dollar.

Bibliography

(Articles That Have Appeared in *The American City*)

1. A 56-Year Exemption, Feb. 1948, p. 19.
2. How Expansion and Contraction Joints Act, April 1946, p. 117.
3. Design of Concrete Pavements for City Streets, June 1947, p. 76.
4. What About These Expansion Joints, by N. C. McCorkle, May 1948, p. 102.
5. How to Build Scale-Free Pavements, May 1944, p. 68.
6. A Street to Fit the Traffic, by William Chadwick, March 1948, p. 106.
7. Dearborn Eliminates Gingerbread, by Fred Storrer, Jan. 1945, p. 95.
8. Thin Paving Goes Farther, by F. W. Liddle, Feb. 1946, p. 93.

Uniform Graded Tax for Alberta Municipalties

THE PROVINCE OF ALBERTA, by Chapter 9 of the Statutes of 1951, has placed real-estate taxation on a uniform basis throughout the cities of the province.

Land continues to be assessed at 100% of its value. Hitherto, the cities used varying percentages of the value of improvements on land as a basis for assessment, the figures ranging from 50% to 75%. The new Act sets a uniform figure of 60%.

Columbus Water Intake Line Built by Tunneling

The open-cut method is discarded because the new 60-mgd line passes under a heavily traveled highway

Above is a completed section of tunneling which is ready for the liner plates.

Construction work is shown in progress at the intake house. Note the three gratings.

TUNNELING, rather than open cut is the method employed by Columbus, Ohio, in building its new water-supply intake line. The line passes under heavily traveled Dublin road and the tunneling makes it unnecessary to block the road and disrupt traffic.

The intake line connects a new screen and intake house on the Scioto River with the Scioto River pumping station. It is designed to handle 60 mgd.

How the Tunneling Works

The construction method, which is unusual, demands an excavation be made about 18 inches to 2 feet long, into which is placed prepared sections of Armco tunnel liner plate, 8 feet in diameter. The operation is continued until the tunnel is fully completed, then concrete pipe 7 feet in diameter will be laid in the opening and the space between the Armco tunnel liner plate and the pipe filled with concrete.

The screen house will have three Link-Belt traveling screens, each capable of receiving 25,000,000 gallons of water per day. The tunnel extends for 92 feet to the city's low-duty pumping station which houses two electrically driven pumps, one Fairbanks Morse, and one Worthington; and also two De Laval steam-driven turbine pumps.

Personnel

The water improvement is being built under the immediate supervision of A. M. Edwards, Senior Civil Engineer, Division of Water, and under the general direction of Elmer Keller, Director of Public Service. Paul Laux is Superintendent of Water.

This view of the tunnel shows the liner plates in place. Plans call for reinforced-concrete pipe to be placed in the line. The space between the outside of the pipe and the plates will be filled with concrete.

Cleaner Air Week

To Be Celebrated October 21 to 27

MAYORS AND civic leaders have been requested to cooperate with the Air Pollution and Smoke Prevention Association of America and with the United States Department of Commerce to focus attention on Cleaner Air Week, October 21 to 27. The week was formerly known as National Smoke Abatement Week, but its name was changed to cover a wider scope of activities.

The Chairman of Cleaner Air Week is Charles N. Howison, who is also secretary of the Smoke Abatement League of Hamilton County, Cincinnati, Ohio. He reports that the Air Pollution and Smoke Prevention Association of America has available a number of publicity aids, including a model proclamation, for use by city officials cooperating in the Cleaner Air Week program. Executive offices of the Association are at 4400 Fifth Ave., Pittsburgh 13, Pa.

Quantity Purchasing For a Small Municipality

THE Borough of Dormont, Pa., is a suburban community of approximately 13,000 people, located immediately south of Pittsburgh, consisting entirely of middle-class residences and small retail stores and offices. Although for many years the Borough has been in excellent financial condition, the virtual impossibility of expansion or further growth has forced Dormont officials to face the unpleasant prospect of a declining tax base in the not too distant future. It was, therefore, the logical move, after my appointment in 1949, to explore all possibilities for more efficient and economical administration.

It was soon apparent that improved purchasing procedures offered one probable method of conserving the tax dollar. Dormont's purchasing up to that time had been conducted in the usual hit-and-miss fashion of a municipality which evidenced little interest in improving the efficiency of its operations. Seldom was there any attempt to obtain competitive bids for items priced below $500 or to benefit from quantity discounts. No inventory control was kept with the result that often work would have to be postponed until supplies had been ordered and received. Probably most serious, seldom were specifications drawn up or tests made to determine the quality of the items purchased.

Purchasing Methods Revamped

Late in 1949, it was decided to revamp Dormont's purchasing procedures completely. At the time we were fortunate to have available the services of a graduate student of the Institute of Local and State Government of the University of Pennsylvania. He was immediately assigned this task on a full-time basis. His first job was an analysis of all of Dormont's purchases of the types of supplies and materials listed below, starting with 1946.

Janitorial supplies
Gasoline
Oil
Tires and tubes
Traffic-light bulbs
Traffic signs and posts
Street-name signs and posts
Wiping rags
Bricks
Asphalt top-dressing
Cement
Sand
Gravel

By ROBERT H. McGREGOR
Secretary-Manager
In Charge of Purchasing
Dormont, Pa.

Asphalt crack-sealer
Road oil
Ready-mix concrete
Expansion jointing
Cinders for snow and ice control
Rock salt
Swimming-pool bags and hangers
Swimming-pool chemicals
Other miscellaneous pool supplies

For each of the items listed above, the quantities purchased during each year, unit prices, vendors, and other pertinent data such as size and specifications were determined. We found the most important of these to be the quantities. The quantities purchased each year were compared with that year's work-program and in that manner the supply and material requirements for the 1950 work-program as forecasted in the annual budget were estimated. After the Borough's existing stock of each item had been inventoried, it was a simple matter to estimate the quantity of each item which would have to be purchased in 1950. In due course, specifications were drawn up on all items covered in the survey and distributed to each vendor showing an interest in Dormont's business.

A great deal of effort was devoted to giving the requests for bids the widest possible coverage. THE AMERICAN CITY's invaluable list of municipal suppliers and the classified section of the Pittsburgh telephone directory were studied exhaustively. The only method of eliciting bids which was not used was newspaper advertising, as Dormont's experience had proved this to be by far the least successful. The borough office was soon besieged with salesmen extremely anxious to obtain Dormant's business.

Standard bidding blanks were mailed to all vendors on our records. On each of these forms was typed the item to be purchased, the quantity desired, and standard specifications. The vendor was requested to fill in the unit price f.o.b. shipping point and the unit price f.o.b. Dormant, and to stipulate any variation of his product from the standard in the specifications. Since storage space in Dormant is limited, quotations were requested on a standing order basis. In other words, the Borough agreed to purchase the quantity of each product desired, but only as it was needed. Payment would be made after delivery. In the event that any item would be needed in a lesser quantity in 1950 than had been anticipated, Dormont agreed to fulfill all purchase commitments over a two-year period. Naturally, the vendor had to agree to hold his price during that period or until the quantities contracted for had been delivered. We considered a plan whereby the Borough would benefit from any general price reduction but would not be forced to pay for any increase, but decided against this because the arrangement would doubtless force vendors to raise their original bids.

Savings

By February 1950 competitive bids had been received on all categories. The total savings on 1950 purchases amounted to $1,042.45, or 14.3% of the estimated cost of the year's purchases at 1949 prices. In addition, the price agreements made it possible for the Borough to force vendors to hold the line during all of 1950. Vivid in the memory of everyone is the sharp increase in the cost of almost all supplies soon after the start of the Korean war. These increases Dormont was able to avoid until 1951.

Systematic purchasing represents one important way to get more for the municipal dollar, and it is amazing how few of our smaller communities have come to realize that fact.

South San Francisco Gets New Police Headquarters

SOUTH SAN FRANCISCO'S recently opened police headquarters —an attractive, one-story building of concrete and glass—offers some new ideas in police stations.

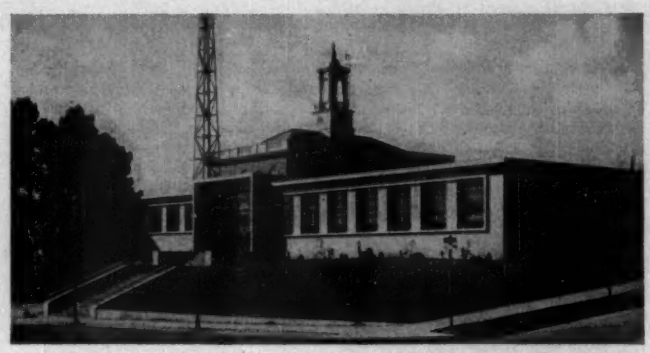
Although the building has been pronounced "breakproof," there are no barred windows to mar its appearance. It's all done with glass-block panels, used ingeniously to conceal a steel grid in all horizontal and vertical joints.

This novel use of glass block was specified by the architect, William Henry Rowe, of San Francisco, to eliminate the "accepted prison characteristics" of the cell wing of the new police station. The glass-block panels also aid in keying the new building with other civic and commercial structures in the vicinity.

While ample daylight is introduced by these panels, glare is minimized because of prisms within the blocks. These direct strong daylight toward the ceiling, which acts as a reflector in distributing the light evenly throughout the cell area. Ventilation is provided by a narrow hopper-like device atop each panel.

Authorities believe that the elimination of bars and gratings is important from a psychological standpoint. This is of particular significance in the two cells assigned for juveniles.

Here, unlike the adult cell-rooms where interior cages are provided, the reinforced-glass-block panels constitute the only safeguard against escape. But because of the absence of bars, these cells have an atmosphere of bright spaciousness—a far cry from the dark, depressing cells in most buildings of this sort.



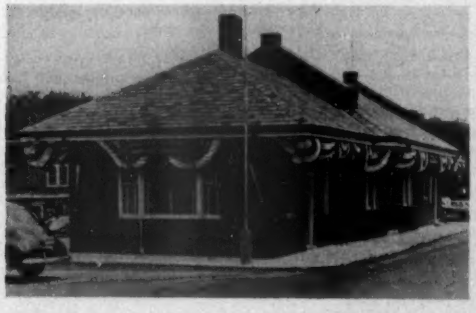
Spring Valley, N. Y., Gets Low-Cost Village Hall

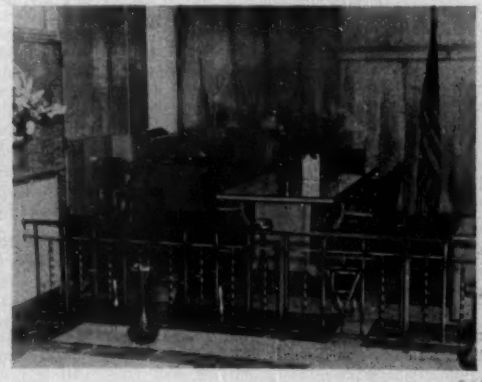
THE Village of Spring Valley, N. Y., turned a problem into an opportunity, and got a substantial bargain as well, when it faced the need for getting new municipal quarters. The former building rented by the village was wanted by its owners, and a move was required.

Before the deadline was reached, the village board considered the various alternatives—rental or renovation of another building or building its own structure. The situation looked black. Then Mayor Anthony Milewski came up with the idea of converting the old, dingy, run-down Erie Railroad station, which sees little use as a ticket office because of the few trains that now operate to Spring Valley.

After negotiations, the Erie agreed to a 10-year lease on the structure, with a renewal privilege of six more five-year periods for a total of 40 years. The Erie's only financial gain in the transaction is the remittance of village taxes on the property, which amounted to $300 a year. In addition to this, the village is required to maintain a small ticket office for the railroad.

Total cost for remodeling the station into attractive village quarters was $20,000. This included birch and pine paneling, fluorescent lighting, a modern heating system, asphalt-tile floors, larger windows, painting, furniture, etc. In addition, a parking space for 60 cars was provided, which can be used by commuters, shoppers, or village-hall visitors. An open house for all residents was held on dedication day.





The new Spring Valley municipal office building, which was converted from a dingy railroad station. At right is a view of the attractive conference-room interior.

M unicipal
P ublic
R elations

The City Tells Its Story

By HENRY DAVIS NADIG

Executive Director, Government Public Relations Association

Looking towards a statement of objectives and a code of ethics to clarify purposes and functions in municipal and national public relations fields

ONE of the first tasks which the newly constituted Government Public Relations Association has set out to accomplish is the development of a statement of objectives and a code of ethics which can provide a solid working basis and a guide for conduct throughout the whole field of government public-relations activity.

It should be the objective of GPRA to make this statement and code so clear and so strong that there can be no question about the Association's fundamental principles. The Association must then assume and carry forward the leadership both in demonstrating and fighting for the principles thus set forth.

The job of public relations in government is to make democratic objectives and procedures more understandable to the people and to work with officials on the policy-making level to help guide them public-relations-wise and thus prevent errors of judgment and mistakes of action.

Public relations in government involves a good deal more than the simple dissemination of information and the development and production of various activities intended to interest people in government and clarify it for them. The public-relations director for any segment of the government, local or national, must constantly guide and assist, warn and advise wherever courses of action involve the public.

The most successful business and industrial enterprises in our country have recognized the public relations function and are capitalizing upon it. Decisions on major courses of action by the executive councils of these corporations receive much aid from public relations counsel.

Yet few municipal chief executives enlist similar co-operation. This despite the fact that government is usually the biggest single business in any city!

Government at no level, with a few rare exceptions, has taken public relations seriously and honestly. Countless mistakes made daily by federal, state, and local government could be avoided by forthright recognition and use of public relations. Millions of dollars now wasted in trying to correct mistakes, overcome misunderstanding, and gain public interest, could be saved.

One of the objectives, therefore, that GPRA must establish and fight for is wider recognition of the top-level function of public relations. What this means is that the public-relations officer should be on hand at all times to indicate to the executive or administrator the public-relations aspects of the course or actions being considered. Properly constituted, he has the right and the privilege of explaining that, in his judgment, this or that will bring these or those results with the public; and he should be equipped to suggest alternative courses, where necessary.

Another and even more important principle, is that of prime responsibility of the public-relations man to the public. This is not to deny the municipal official's responsibility to the public, but to point up that the public-relations man's responsibility involves the charge of making as clear as possible the acts and words of officialdom. This is very different from an administration's responsibility, as such, to the people, but it goes hand in hand with that responsibility and, properly, should be a part of it.

Still another principle which must be considered, is that the public relations officer should be the key figure, or coordinator, in connection with the production and dissemination of information about specifically governmental activities. Whether or not he has his finger in every pie, it is essential that all channels of communication at least be under his supervision.

Independence from political partisanship and from factional politics is also to be held a vital principle. This is, admittedly, one of the toughest nuts to crack. But it can be cracked—if the issue is faced clearly and if staunch leadership is forthcoming both in GPRA itself and among the public-relations men practicing in government. Obstacles in the pathway toward achieving this principle can be cleared away by sincerity of purpose and earnestness of endeavor. The effort to accomplish this should be a part of GPRA's own public relations program.

Government at its various levels in a democratic society exists to meet the needs of people for means by which they may achieve control of their common interests, properties, and activities. As the last three have grown in size and scope, government, likewise, has grown —both in obligations and functions. It has become more and more complex by the very extent of the demands placed upon it.

With this increase in demands, local government particularly has tended to try to absorb countless extra duties and to provide a growing number of services with the least possible expansion of its own staff operation. This has been especially true in the case of those requirements which are distinctly and logically a function of public-relations. The result is that we find in most instances public relations functions and duties being performed either largely by the chief executive or administrator himself or are parceled out to a number of different officials or are neglected altogether except in those instances where necessity requires something to be done.

It is this haphazard handling of various phases of public relations that is costly and impedes the progress of wholesome municipal development. While it is becoming more and more recognized that the public must be thoroughly informed, it is to a much less degree being realized that policy must also be guided with regard to its net effect upon the public. The effort to do a whale of a job in the information phase of public relations cannot in the long run offset the failure to take hold of and use realistically the policy-aiding phase of public relations for local government.

Responsible Government Public Relations

These are all points that GPRA must make clear and upon which it must assert a vigorous leadership. Public relations for government must become recognized as an essential arm of the government at all levels—an operating arm which sees to it that the public is thoughly informed and which aids government not only to keep to the straight and narrow but also to avoid courses which may be harmful to the public, rankle the public, or create misunderstanding on the part of the public.

Under GPRA leadership, the public relations man or woman in government will, it is hoped, become increasingly a trusted and valuable servant of the public. He will refuse to whitewash inefficiencies and ineptitude in public office and at the same time he will prevent, wherever possible, statements or actions which are out of line with the public interest.

Properly established and straightforwardly functioning at all levels of government, public relations can be one of the greatest forces for making democracy really work. Courage, honesty, facing-up to facts are required in the striving for this objective. Widespread understanding of the functions of public relations has to be created. Weaklings in the field of public relations will have to be dropped as the struggle proceeds. Officials will have to be shown —through demonstration and proof— the vital part that public relations, as a well-organized operation, can play in government.

Basically, GPRA will serve the government public-relations field as a research and information clearing-house for the development and application of effective methods of communication between all levels of government and the people. Implicit in this service is leadership in the promotion of principles and standards of public relations throughout the field and extensive work in bringing forward public-relations personnel of the highest caliber.

GPRA cannot afford to truckle to the timid, to pander for the politician, nor to cater to the queasy. The right kind of public relations in government at the municipal level can be the greatest force for democracy since advent of the city-manager movement. In the upper levels of government, it also can be a force for strengthening democracy. Fearless GPRA leadership, government understanding and cooperation at all levels, and public faith will prove this.

What Michigan Cities Have Learned About Fluoridation

FLUORIDATION as a dental-health measure continues to be a live subject among water-works operators. The Michigan Department of Health, in its *Water Works News*, records some of the operating details that have come to light today. For example, where dry feed machines are used and it is necessary to either pump the solution or use a water injector, considerable incrustation of the lines or pumping equipment has been experienced. This problem has been reduced by placing a Micromet or similar type of feeder in the water-supply line to the dissolving tank. Micromet, or other slow-dissolving crystalline phosphates, act to retard the formation of calcium fluoride. Another method would be, of course, to use softener—if available at low cost. The treatment requires that a substantial amount of water be supplied to the dissolving tank.*

In those installations where sodium fluoride is fed as a solution using a hypochlorinator type of chemical feeder, soft water should be used. The simple solution to this is the installation of a home zeolite type of softener to treat only the water used for preparing the fluoride stock solution.

The Taylor water analyzer, using liquid standards, and the Hellige Aqua Tester, employing permanent non-fading glass color standards, are commercially available equipment for fluoride determinations. The Taylor standards are based on a modification of the Lamar reagent which has been formed to lose its strength rapidly. Michigan health authorities recommend that the reagent be purchased only in quantities that will be used up in a month. The Hellige color standards are based on the official APHA and AWWA procedure, using Sanchis-Scott reagent. To insure fresh reagent at all times, the Hellige solution is supplied in components ready for mixing before use.

Equipment Used

To date, the equipment used in Michigan has been either gravimetric of volumetric dry feeders using sodium fluoride or sodium silicofluoride or a hypochlorinator type of feeder applying a solution of sodium fluoride. Sodium silicofluoride, because of its low solubility, is usually fed as a slurry. Other equipment also is approved for use in Michigan, along with at least one of the fluoride chemicals. One piece of equipment utilizes the property of sodium fluoride, which provides a uniform solubility through a rather wide temperature range. A saturated solution of sodium fluoride is prepared and is fed by a hypochlorinator-type of feeder so that a coarse grade of sodium fluoride may be utilized, thereby cutting down on the dust hazard and adding simplicity in preparing the stock solution, since the solution drum will hold a 375-pound drum of sodium fluoride salt. A float-controlled valve insures a supply of water to the drum so that as much as 20,000,000 gallons of water can be treated with one charge of chemical.

Hydrofluosilicic acid has not been used in Michigan. However, it has been used elsewhere, and is approved for use in this state. It is particularly useful where large amounts of water must be treated.

Only 3.79 gallons of the acid at 30% concentration are needed to increase the fluoride content of 1,000,000 gallons by 1 ppm. The acid is packaged in drums of a composition material, and may be fed directly from the original container into the water line. The acid is corrosive to glass or crockery and it is, therefore, desirable that this chemical be used at installations where the rate of pumpage is sufficiently high that the solution need not be diluted so that hazards due to handling are reduced. The solution as received contains 23.7% F. It can be handled directly from the shipping container, thus eliminating transfer to a feeding tank.

* EDITOR'S NOTE: Recent studies have shown that large concentrations of phosphate interfere with the fluoride determinations; hence the metaphosphates should not be used indiscriminately.

New Course in Government Publicity and Information

ESTABLISHMENT of one of the first courses in any American university in "Government Publicity and Information," has been announced by Dr. William J. Ronan, Director of New York University's Graduate Division of Public Service.

Maxwell Lehman, editor and co-publisher of *The Civil Service Leader*, and Leo J. Margolin, public-relations executive and former newspaperman, have been appointed lecturers for the course.

This course, which began September 26, offers graduate students preparing for, or already in, government service systematic study of philosophy, problems and techniques of public relations, and the dissemination of government information to the public.

City Managers Hold Largest Meeting

WITH an attendance of 323 city or county managers and 321 guests, the International City Managers' Association held its 37th—and largest—annual conference at the Poland Spring House, Poland Spring, Maine, September 9-12.

One has come to expect of these ICMA meetings a well-planned program, prompt and business-like sessions, and an excellent balance between prepared papers and informal discussions. The 1951 meeting was no exception.

Of special value, in THE AMERICAN CITY's opinion, are the simultaneous group sessions in which the delegates break up into seven population groups for discussion of subjects to be selected by each group. Here are a few paragraphs from the reporter's summaries of the discussions held at these sessions:

Purchasing Insurance

(Reported by J. Douglas Mackintosh, City Manager, Lancaster, S. C., for the 7,000-12,000 population group)

Procedure in purchasing various types of insurance was of most interest to the managers in this group. Several managers explained how they solved the problem of purchasing fire, fleet, liability, and workmen's compensation insurance by calling the various local agents together, and having them select one of their number to act as key agent or broker. In this way the city buys one policy for each type of insurance, and the business is distributed among the various agents in the city.

Integrating Police and Fire Department

(Also reported by Mr. Mackintosh)

Integrating police and fire departments was the second topic for discussion. A Maryland manager reported that there is a full-time police department in his city, and that all of the men are called on to fight fires. They have volunteer firemen only. All members of the police force are required to take the firemen's course of instruction at the state university.

A few managers spoke in opposition to this plan—difficulty in ranking or rating the men; finding and employing men capable of doing both jobs competently would be hard. The possibility of a large fire occurring during peak hours of police duties was also cited.

It was the consensus that the plan has possibilities and that it would be most practical in the average small town or city.

(An excellent article on organization of "Fire and Police Service in Small Cites," by H. G. Pope, Executive Director, Public Administration Service, Chicago, was published in the May 1951 issue of *Public Management.*)

Policy on Selection or Replacement of Police Cars

(Reported by Emerson Walker, City Manager, Ellwood City, Pa., for the 12,000 to 20,000 population group)

Two of the cities are renting police cars from motor agencies on a mileage basis. This service includes insurance, maintenance, etc., but not fuel. Cars are replaced by the agency at about the same interval as replacements are made when ownership resides in the municipality. It was suggested that better maintenance results from this plan, since the auto agency retains ownership and is interested in its own property. It was pointed out that since several private corporations have found it economically possible to use the rental method, such method should likewise be practical for municipalities.

In most municipalities of the group which own police cars, annual replacement of cars with competitive bidding is the policy.

It was suggested that station wagons and sedan delivery jobs could be used in some towns to serve the double purpose

Outgoing and incoming officers and other members pose for a photograph at the 37th annual conference of the International City Managers' Association. In the front row, seated, left to right: newly elected Vice-Presidents George E. Bean, Grand Rapids, Mich.; G. O. Summers, Longview, Texas, and Donald C. Wagner, Yonkers, N. Y.; newly elected President Bill N. Taylor, Columbia, Mo.; retiring President Leonard G. Howell, Des Moines, Iowa; newly elected Vice-Presidents Rene Laberge, Lachine, Quebec, and J. W. Bliss, Minot, N. D., and Executive Director Clarence E. Ridley, Chicago, Ill. Back row, left to right: Past Presidents J. R. French, Verdun, Quebec; Don C. McMillan, Pasadena, Calif.; C. A. Harrell, Norfolk, Va.; John H. Ames, Ames, Iowa; Steve Matthews, Lubbock, Texas; Ross Taylor, Oklahoma City, Okla.; Lyman S. Moore, Portland, Maine, and G. L. Opper, Riverside, Ill.

for ambulance calls and patrolling. A poll showed that almost half of the cities represented render some public ambulance service.

Force Account vs. Contract on Public Construction

(Reported by E. C. Brandon, Jr., City Manager, Burlington, N. C., for the 20,000 to 30,000 population group)

It was pointed out that a solution to the problem is affected by : (1) the difference in labor rates to a city and to the contractor; (2) labor availability; (3) local situation as to contractors, and (4) size of job under consideration.

Some cities have found it advantageous to purchase materials, such as pipe, on bid and to let a contract for the installation after arrival of the material. The manager must constantly compare force account costs with contract costs; and care must be exercised to include *all* costs in his force account determination. He must bear in mind insurance costs, both compensation and equipment; depreciation on machinery and equipment; whether machinery and equipment will remain idle much of the year; and the cost of training competent personnel, as well as the usual items of labor, materials, and engineering.

Use of Business Machines

(Also reported by Mr. Brandon)

In a discussion of the extent to which a city can use bookkeeping and accounting machines, it was found that (excluding utility billing) approximately half of those present did not use machines and half did. It is felt that a city will probably find it economical to change from hand bookkeeping methods to machine methods sometime while in this population bracket. In so doing consideration should be given to the possibility of including other work, such as tax billing; to the exact make of machine best suited to your city, and to the savings in personnel, time, and space which may be had from such a change.

Rental vs. Ownership

(Reported by Donald P. Wolfer, City Manager, Albany, Ga., for the 30,000 to 50,000 population group)

Opinion is divided. Several cities favor the purchase of all equipment on the ground that: (a) it is cheaper; (b) it is always available when needed.

Other cities point out that this practice ties up skilled labor and sizeable capital investment during slack, non-productive months.

In approaching the problem the group felt that separate consideration should be given to construction equipment as distinct from operating equipment. In considering the rental or purchase of equipment, one should be governed by:

(a) Local conditions (public opinion)

(b) The time limitation on the work to be performed (whether emergency or not)

(c) The length of the work season

It was the consensus of the managers attending this session that cities could do construction work 8% to 10% cheaper by using their own equipment than by renting it, if they can schedule their work programs in such manner as to keep their equipment busy most of the time.

The principal speaker at the annual ICMA banquet was Sumner T. Pike, member of the U. S. Atomic Energy Commission. While holding out great hopes for peace-time uses of atomic energy, Mr. Pike urged the city managers to stimulate increased action in their respective communities in preparedness for civil defense—especially so in "non-target" areas which in case of atomic attacks on target cities may be able to render substantial aid to such cities.

The 1952 Annual Conference will be held in Kansas City, Mo.

A much more detailed report of the 1951 Conference will, of course, be published by the International City Managers' Association, 1313 East 60th St., Chicago 37, Ill.

Pennsylvania Defense-Boom Area Tackles Critical Problems

By LOUIS P. DOLBEARE
Metropolitan Consultant
Philadelphia Housing Association

THE Boards of County Commissioners of Bucks, Delaware, and Montgomery Counties, in the Philadelphia metropolitan area, have formally ratified an agreement which sets up an official organization to be known as the Southeastern Inter-County Planning Commission of Pennsylvania. The Commissioners of Chester County, the fourth county in the Pennsylvania section of the suburban area, have stated their intention of adhering to the compact, but have not yet done so.

All four counties have planning commissions which are official agencies under Pennsylvania enabling legislation and are appointed by the county commissioner. The Montgomery County Planning Commission has been staffed and operating for more than a year; Delaware County, for over seven months; Chester has had a planning director for three months, and Bucks has just now been able to find and appoint an executive director.

The metropolitan commission is to have a full-time technical staff which will prepare over-all base maps and information, and will integrate the separate plans of county commissions into general plans for the development of the area as a whole.

A tentative budget of $18,000 for the rest of 1951 has been discussed, but proportionate allocation of this sum among the counties on a basis of population, area, wealth, or combination thereof, has yet to be agreed to.

The inter-county commission is expected to play a significant role in solving the critical problems resulting from rapid growth in the area. This is particularly true in hitherto rural lower Bucks County, where U. S. Steel is building the $400,000,000 Fairless Works, expected to employ some 6,500 workers, many of whom do not now live within easy commuting distance. (The building of at least 16,000 houses in the immediate area has already been announced.) A major highway net and an industrial location study are other immediate problems.

Planning and Zoning Progress

In May of 1951 the following municipalities in the lower end of Bucks County, nearest the steel plant, had planning commissions and zoning: Morrisville, Lower Makefield, Lower Southampton, Newton Borough, and Yardley. The following had zoning ordinances only: Middletown, Penndel, Langhorne Manor, Langhorne, Warminster, Ivyland, Northampton, and Newton Township. Upper Makefield had a planning commission, but no zoning. Since then, Bristol Township, recently changed to first-class from second-class status (the first township in the county to do so), has announced that it will appoint a planning commission. Zoning ordinances are under discussion in Bristol Borough and Falls Township (in which is the site of the plant), both of which have previously defeated such proposals.

A number of active citizen groups in the Philadelphia area have helped to create a climate favorable for planning at all levels. These include: the Philadelphia Housing Association and the Citizens' Council on City Planning in the city; the Housing and Planning Advisory Committee of Delaware County, the Housing and Planning Committee of Montgomery County, both affiliated with the Housing Association; and the Citizens' Council for Bucks County Planning.

West 63rd Street, a view with old fixtures which contained 6,000 lumen lamps and were mounted at 18 feet.

West 63rd Street after the installation of modern luminaires, with the same lamps, at a height of 25 feet.

Cleveland Lights *Every* Street Correctly

400 of 1,300 miles are already relighted to meet the American Standard Practice for Street and Highway Lighting, starting with the "Fearways"

By W. T. SOJEBA
Chief of Lighting Bureau
Cleveland, Ohio

NEW street lighting is being installed in one section or another of most large cities all the time, but the City of Cleveland is being relighted as a whole. Moreover, not only does the new lighting meet American Standard Practice for Street and Highway Lighting but may exceed these famous minimum recommendations. The object was and is to bring all the benefits of modern lighting to drivers and pedestrians in every section of the city and to the shopping and enjoyment-loving public.

During the last 10 years, the city's Bureau of Street Lighting has used yearly crime and accident statistics as the basis for a program to educate citizens on the need for adequate lighting. With the cooperation of the General Electric Company, surveys were made on those primary and secondary thoroughfares known to be areas of recurring accidents and crime. Without exception, General Electric light meters indicated standards of lighting far below those recommended for safety by the American Street and Highway Lighting Standards. The Bureau's program encompassed the 75 square miles within the City of Cleveland boundaries, a total of 1,300 street miles, and in place of the existing 25,000 luminaires specified over 45,000 lighting fixtures. Designed to meet the needs of the entire metropolitan population, it gave equal recognition to the demands of commerce and industry, of the free and safe flow of vehicular traffic, and of pedestrian safety in heavy traffic areas.

The tragic cases of little Sheila Ann Tuley and Dr. Philip C. Leavenworth removed the last traces of apathy toward a system of better street lighting. Sheila Ann, an eight-year-old resident of Cleveland's East Side, was attacked and murdered by a sex deviate on a dark side street not far from Superior Avenue. The vicious assault raised a clamor of indignation. Following closely upon Sheila Ann's murder, an errand of mercy ended in tragedy when Dr. Philip C. Leavenworth, en route to his home in the early morning after completing a maternity case, drove his automobile through a flimsy dead-end unilluminated street barricade into the Cuyahoga River, at an intersection in the city's downtown waterfront area.

An effective part of the Bureau's program was the preparation of a "Roll of Casualtyways' and a "Roll of Fearways," listing nighttime horrors. In 1946 alone, the Police Department reported 201 cases of purse-snatching, 458 robberies, and 67 pedestrian deaths, all occurring at night. The "Roll of Casualtyways" consisted of a series of maps on which were spotted the numbers and locations of all traffic fatalities over a period of six years. This was used to establish a schedule of priority for installing new and improved lighting. "Fearways" were defined as streets having a serious deficiency in illumination, and they proved to be those streets which police records disclosed as locations of numerous annoyances, molestations, and acts of violence.

An important phase of the program consisted in comparing the existing illumination on each city street with the standard of illumination that was recommended for proper street and highway lighting.

In 1948 100 miles of priority streets were lighted. Today the figure is 400

A Word from Mayor Burke

No other city, regardless of size, can approach Cleveland's record of over 400 miles of streets lighted since 1947 to the standards established by the American Standards Association. Yet, according to our plan, we are not even half-way along in our attempt to make Cleveland the safest city in the United States. However, most of the danger spots have now been eliminated and the major work still to be done is in residential areas.

Cleveland's street-lighting program was undertaken as the result of high night-accident rates and crimes against people—purse-snatchings, muggings, and assaults on women and children. With night traffic less than 30% of the day volume, 70% of our fatal accidents were occurring at night. We cannot light to daytime levels, but we have found that the amount of light recommended by the American Standards Practice for Street and Highway Lighting will result in very substantial reductions in fatalities. The program will be completed in about five years.

THOMAS A. BURKE

Mayor Burke (left) and the author.

Amply illuminated streets prove an immeasurable aid to members of Cleveland's Fire Department. En route to answer a call, the driver of this pumping engine will have no difficulty in locating the hydrant seen in the foreground.

miles, with 100 miles per year, the rate of installation of new lights. Near the end of 1948, funds allocated for the program were nearly exhausted. A bond issue was placed before the voters. It was one of only five which were approved, and it was approved by 72% of the voters. The Bureau's lighting program was assured.

In 1948 night pedestrian deaths fell 31% on those streets lighted during the first year. During that year, daytime traffic deaths increased 70%. Over the last four years there has been a reduction of 34% in pedestrian after-dark fatalities, against an increase of 15% in daytime pedestrian traffic fatalities.

On the street given highest priority on the "Roll of Casualtyways," because of 15 deaths per mile during the previous 10-year period, not a single nighttime fatal accident has been reported during the last three years. On another main artery, in the industrial section, recording 13 traffic deaths per mile, no after-dark fatal accidents have occurred since relighting. On a national highway penetrating the city, where traffic deaths averaged five per mile, again not a single nighttime traffic death has been reported for the two years since better lights were installed.

Equally impressive in its way is the attendant reduction in economic losses. The National Safety Council estimates that economic losses for each traffic fatality amount to an average $65,000. Since the city's relighting program was begun, Police Department statistics reveal that there has been an average reduction of 13.5 pedestrian deaths per year. Thus, the cost of the program, amounting to $600,000 per year, is offset by the money-value alone placed on human life.

Crime, too, in many of its vicious and sordid manifestations, has seen a lessening in Cleveland. From the record 201 nighttime purse-snatchings in 1946, the count has fallen to a low of 44 cases in 1950, or a decrease of 78%. Police records listing rape show a decrease of 3.4 cases per year since the inception of better lighting. Of nighttime robberies and assaults, 927 cases during two years prior to relighting fell to 849 in the following two years, a reduction by 78. During this same two-year period, *daytime* robberies and assaults have increased by 58 offenses.

Aside from the life and death and dollars and cents, Cleveland citizens walk on lighted streets at night with a minimum of discomfort. The number of retail stores doing business in the evening is constantly increasing, because more people are on the streets at night. The Cleveland Fire Department reports better luck in locating hydrants instantly.

The end of 1951 will see the Bureau's "must" program well past the half-way mark to completion.

Need for Blood Creates Immediate Emergency

THE Department of Defense, in its *Military Production News* of September 10, calls attention to the fact that requirements in Korea have depleted the World War II blood bank, and that there is an urgent need for 300,000 pints of blood monthly.

As the Department of Defense points out, "Blood, unlike vitamins or drugs, cannot be made synthetically and purchased by prescription at the corner drugstore. The only way to produce blood is in the bodies of men and women. . . . The only way an injured soldier or sailor or airman can get the blood that will save his life is by the personal gift, in a simple and relatively painless manner, of a patriotic American."

Here is an opportunity for mayors and other municipal officials to take leadership in cooperating, through local Red Cross chapters and otherwise, in this special Armed Forces Blood Donor Program.

Prints of this poster and other posters, streamers, window cards, pamphlets, and publicity material are available from the Office of Public Information, Department of Defense, Washington, D. C.

Memorial Band Shell a Major Civic Asset

An audience of 5,000 at the dedication performance at the Kiwanis Band Shell.

By ALLAN J. RUSH
Mayor
London, Ontario

LARGE audiences during the summer just ending have shown hearty appreciation by the people of London, Ontario, of the Kiwanis Band Shell in Victoria Park and of London's fine local bands.

Erected in 1950 as a memorial to the musicians who entertained servicemen throughout the trying years of World War II, this $45,000 project was sponsored by the local Kiwanis Club, which raised two-thirds of the cost from its own members, the rest provided by the City of London.

Throughout the summer of 1951 there have been not less than three, and as many as five programs each week. Every Sunday evening from June 10 to September 2 Martin Boundy and his Broadcasting Band have appeared at the Band Shell on a national network of the Canadian Broadcasting Corporation. Following this half-hour program, another local band has continued the program for one hour for the benefit of the audience in the park. In addition, there has been a local band on some Sunday afternoons and some Thursday evenings. Either on Wednesday or Thursday evening of each week there has been a record concert under the auspices of the London Public Library, and recently this program has included moving pictures provided by the National Film Board. On several Tuesday evenings a record concert has been provided through the courtesy of Radio Station CFPL-FM. A similar program is being provided during the noon hour five days a week.

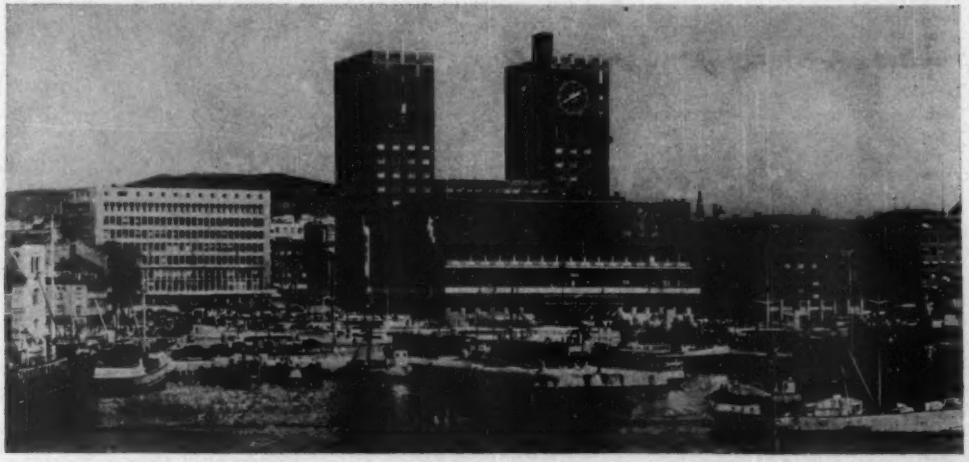
An oustanding band from outside the city, that of the R.C.A.F., was present on July 17th. On two evenings, immigrants recently arrived from Europe, and attired in their native dress, have presented their native dances and music.

New Town Hall For Oslo, Norway

DEDICATED late in 1950, the new Oslo Town Hall is located in the center of the city, on the shores of Oslo Fjord, and can be seen from all directions. Work on the building foundations began in 1933, and the building was scheduled to be completed in 1941. But with the war, and later post-war difficulties, it took until 1950 before the building could finally be opened.

An important traffic artery has been extended past the building along the sea front. The main drive at the land side of the building is approached from a cleared semicircular open space more than 300 feet in diameter.

The great hall in the central part of the building is flanked by the town counsellor's offices. The handsomely decorated hall will be used for civic gatherings of various kinds. At second-floor level, the hall is surrounded by a gallery which gives access to several other rooms designed for civic functions, including a banqueting hall for 450 persons, served from a kitchen in the loft above. The two flanking towers, 13 stories high, contain most of the city's administrative offices.



Oslo's Town Hall, designed by architects Arnstein Arneberg and Magnus Poulsson.

Crime Must Be Attacked at the Local Level

IT IS to be hoped that many local officials and civic groups will be stirred to action by the charges made and remedies suggested in the final report, released on August 31, 1951, of the United States Senate's Special Committee to Investigate Organized Crime in Interstate Commerce.

In many cities, large and small, visited by the Committee in the course of its investigations, it is reported that corrupt officials have been forced to resign, grand juries and enforcement officials have doubled their vigilance, and gangsters have gone into hiding.

"In the field of narcotics," the report states, "the committee's searchlight has created a nationwide awareness of the seriousness of this great evil. As a result, investigations have been started, court procedures have been modified, remedial laws have been passed, educational programs have been undertaken, and the despicable drug peddler has run for cover."

The report emphasizes the fact that crime must be attacked at the local level.

The public now knows that the tentacles of organized crime reach into virtually every community throughout the country. It also knows that law enforcement is essentially a local matter calling for constant vigilance at the local level and a strengthening of public and private morality.

Establishment of a National Crime Coordinating Council is recommended by the Committee, one of the activities of which would be "to serve as a clearing-house for information regarding local action taken in connection with the illegal sale and use of narcotic drugs.

At the present time, aside from the information on enforcement supplied by the Bureau of Narcotics, there is no central agency to which civic, educational, religious, and enforcement agencies may turn for information regarding the subject of narcotics. Each community is approaching the matter in its own way without having the benefit of experience gained in others. Duplication and waste of effort would be reduced if coordination of activities could be brought about by use of a central clearing agency.

The promotion of narcotics education is also urged.

A nationwide educational program regarding the character and effects of narcotic drugs and the nature and results of addiction should be developed by the Federal Security Agency and made available to educational institutions, civic organizations, and enforcement authorities throughout the country. The objective of the program should be to lift the veil of secrecy from the subject and to bring it out into the open where it can be dealt with in an intelligent and effective manner. The present authority and funds of the Federal Security Agency are sufficient for this purpose.

"Suggestions for Action by State and Local Governments" is the title of an important section of the report. These suggestions are presented under the following headings:

1. Revision of outmoded laws and adoption of uniform laws
2. State legislative or executive investigations
3. Enact laws relating to barbiturates
4. Provide treatment facilities for addicts
5. Conferences of local prosecutors
6. Organization of state crime conferences of citizens groups
7. Use of state income tax data
8. Utilization of federal occupational-tax data
9. Closer relations with federal enforcement agencies
1. Prohibiting political contributions by racketeers.

Under heading 9, state and local enforcement units which deal with organized crime are invited to avail themselves fully of the research and training facilities and the accumulated data which are available in parallel federal agencies, the Federal Bureau of Investigation, the Narcotics Bureau, and the Alcohol Tax Unit, and to reciprocate with assistance and a steady flow of suggestions and information to these agencies.

THE AMERICAN CITY recommends to all municipal officials and civic-organization executives a careful reading of this Final Report of the Special Committee to Investigate Organized Crime in Interstate Commerce.

The members of the Committee from its inception have consisted of Senator Estes Kefauver, Democrat, Tennessee; Senator Herbert R. O'Conor, Democrat, Maryland; Senator Lester C. Hunt, Democrat, Wyoming; Senator Charles W. Tobey, Republican, New Hampshire, and Senator Alexander Wiley, Republican, Wisconsin. For the period from the creation of the committee to May 1, 1951, Senator Kefauver acted as Chairman, and Senator O'Conor has served as Chairman since May 1, 1951.

Richard G. Moser served as Chief Counsel for the committee; Downey Rice, as Assistant Counsel, and James M. Hepbron, as Administrative Assistant.

Let Us Invest Law Enforcement With Romance!

If, instead of the glamor of romance and heroism which our American imaginative minds too frequently throw around those who break the law, we would invest with a little romance and heroism those thousands of our officers who are endeavoring to enforce the law, it would itself decrease crime. Praise and respect for those who properly enforce the laws, and daily condemnation of those who defy the laws, would help. Perhaps a little better proportioned balance of news concerning those criminals who are convicted and punished would serve to instill the fear of the law.

HERBERT HOOVER

(From the President's address in New York, April 22, 1929.)

Cities Regulate Downtown Signs

A GROWING number of cities are striving for that uncluttered look for their business districts by giving increasing attention to regulation of signs, the American Society of Planning Officials reports.

In the business districts, one practice is to relate the size of any permitted sign to the frontage of the business structure. Rye, N. Y., for example, permits signs which have a total area not exceeding 2 square feet for each foot of frontage. In Fairfax County, Va., 3 square feet of sign for every lineal foot of frontage is permitted, provided that the aggregate area does not exceed 120 square feet and that no single sign shall exceed 60 square feet.

Overhanging signs are also being banished from city streets. The chief objection to signs that project over the sidewalks is that they are unsightly, a menace to safety, and a barrier to light and air. Then, too, they hamper fire fighters when a blaze breaks out in the downtown buildings.

Pioneers in the ranks of cities having ordinances regulating projecting signs are Washington, D. C.; Madison, Kenosha, Janesville, and Racine, Wis.; Winnetka, Ill., and Hartford, Conn. Generally, overhanging-sign bans include provisions requiring that permits be obtained before installation of signs and establishing standards of construction—such as resistance to wind pressure of 30 pounds, a minimum height of 10 feet above the ground, and a maximum overhanging of 42 inches.

Businesses installing signs are usually required to carry public-liability insurance providing not less than $10,000 liability to any one person, or $20,000 liability for any one accident.

Other cities provide that no projecting signs may be located in their business districts, while others are reducing the distance signs may protrude beyond property lines. In Highland Park, Mich., and Larchmont and New Rochelle, N. Y., the distance has been cut to 12 inches.

Zoning and Planning Notes

Edited by NORMAN WILLIAMS, JR.

Minimum Building Size Again

NEW JERSEY. *Lionshead Lake* v. *Wayne Township*, 80 Atlantic (2d) 650 (Superior Court, April 27, 1951).

The most important current case dealing with local regulation of the minimum size of residential buildings involves the Township of Wayne, a sparsely settled area of 25 square miles located just north of the City of Paterson, N. J. The Township includes several sizable lakes, a considerable number of summer homes, and a total population of about 11,000. When this section of the local zoning ordinance was challenged by a builder, the first trial resulted in summary judgment for plaintiff, but on appeal the case was remanded for a trial of the facts. After a lengthy second trial, the same Judge reiterated his original ruling.

The ordinance in question required 768 square feet of floor area for a one-story house, 1,000 square feet for a two-story house with an attached garage, and 1,200 square feet for any other two-story house. It appeared that the actual dimensions prescribed for a one-story house were selected with an eye to standard dimensions of lumber. The New Jersey Code of Minimum Construction Requirements for One- and Two-Family Dwellings, and the federal housing standards, both permitted less space; and this builder wanted to construct three-room houses with 444 square feet, and four-room houses with 676 and about 600 square feet. It was estimated that a conforming building would cost $11,000-$12,000 if mass-produced, and about 20% more if built individually. About 70% of the buildings in the Township conformed to the prescribed size, and about 30% did not. On the other hand, only about 30% of the population could afford to buy houses of the stipulated size, while 70% could not.

The Court held as follows:

> The ordinance, in its present form, therefore, practically provides that no house costing less than a certain sum may be erected in the entire community, let alone a specified area, and this it cannot legally do. . . . No person under the zoning power can legally be deprived of his right to build a house on his land merely because the cost of that house is less than the cost of his neighbor's house.

Arguments for the Ordinance

In the second trial, defendant Township made an elaborate presentation of expert evidence, with the help of the State Division of Planning and top-flight experts in planning and public health. The arguments in favor of an ordinance such as this may be summarized as follows:

1. In areas with many larger residences, the residents often express considerable opposition to small homes, because of their appearance and because of the type of people likely to occupy them. This attitude is likely to be reflected in a decline in property values—thus harming municipal finances—and is often justified by the need to protect "the character of the neighborhood" and to promote "the most appropriate use of land in the area."

2. The taxes paid on inexpensive small houses do not provide enough revenues to cover the cost of schools, fire protection, etc., for their occupants. Such houses are, therefore, a direct as well as an indirect threat to the municipality's economic structure. In fact, the more inexpensive the home, the bigger the threat.

3. The reality of the need for regulating such structures is indicated by the number of communities adopting such regulations. In New Jersey, some 80 of 300 zoning ordinances include such a provision.

4. Small homes are harmful to the mental and physical health of the occupants, primarily because of the increasing tension of family life in inadequate space.

Arguments Against

The arguments against such ordinances do not stem from any enthusiasm for the miserable little boxes which are often built nowadays, but from a basic regard for democratic living. These arguments may be summarized as follows:

I

The first argument above — obviously the real issue—should be stated rather more bluntly. May the powers of government be invoked to protect wealthier people from having less wealthy neighbors? —i.e., to promote economic stratification. Whatever the situation may be with respect to private action toward the same end, direct public enforcement of economic ghetto-ism is obviously untenable in any society which takes its democratic pretensions seriously. In deciding the issue on this point, Judge Davidson exemplified the toughness and vitality of our democratic tradition, which has led most American courts to the same result. Those critics who are inclined to be impolite refer to regulations of the Wayne Township type as "snob zoning." Stated more broadly, what is involved is whether public opinion —in a small area—is a proper basis for the police power.

The alleged effect on property values near by, often brought up as a separate argument, is, of course, merely a restatement of the same point in different terms. Property values are obviously important to a locality, but they may be affected by all sorts of factors; and phrasing the argument in these terms is merely a standing invitation to confusion in a zoning case. Some of the factors affecting values provide a proper basis for exercise of the police power; others do not.

Essentially the same point applies to the arguments about "protecting the character of the neighborhood" and "promoting the most appropriate use of land in the area" —phrases which are sometimes brought up as if they solved all problems. Such phrases, while satisfactory enough as broad indications of the general purposes of zoning, are too vague and abstract to serve as a satisfactory independent basis for exercise of the police power. For precise and meaningful legal analysis of the basis for excluding certain buildings from an area, it is necessary to be more specific. What characteristics of a neighborhood are referred to? What criteria are to be used in determining whether certain uses of land are appropriate in certain areas? Once these questions are asked in the present case, we are taken right back to the basic issue of snob zoning. As with the argument about property values, these general phrases cover basic points of policy, which may or may not be tenable when stated frankly. Opinions may differ about the policy; but there is very little to be said legally for half-concealing it in fuzzy abstractions.

It should, perhaps, be emphasized that the regulations discussed here involve quite a different issue from that presented by regulations on minimum lot size and maximum building size—which can obviously be justified on the basis of providing protection for light, air, and open space, and against congestion.

II

The attempt to protect municipal tax revenues by forbidding small homes in certain areas runs directly counter not only to national housing policy, but to the whole trend of modern tax legislation based upon ability to pay. The demand by wealthier groups to protect themselves from having to help pay for education, fire protection, etc., for the less well-to-do, is familiar enough; but following such a policy, particularly on education, is hardly a good way to promote the well-being of the next generation.

III

The rather widespread adoption of such ordinances merely underlines and makes more serious their dangerous implications—in promoting a tendency towards the development of wealthier communities paying lower taxes, and—since the poor must live somewhere—poorer communities unable to pay for a decent education of their children.

IV

The fourth point above, while rather obviously an afterthought, is none the less a somewhat more serious one. State-wide or national regulations on minimum room-size or building-size are admittedly valid

under the police power, although in a period of rapidly rising building costs though they might tend actually to discourage the provision of better housing. In effect, the argument on this point is that, when such restrictions are imposed locally, if they exceed recognized minimum standards for healthful housing, the courts should recognize that the real motives are as described above, and treat this argument as a mere subterfuge.

Whatever may be the merits in general, the argument backfired seriously in this case. Expert testimony presented by defendant Township stated that a minimum requirement for healthful living would provide 400 square feet for one person, 750 square feet for two persons, and so on up. Since the ordinance required at least 768 square feet, defendant was forced into the position of arguing that no dwellings should be constructed for families with less than three persons. As the Judge tartly observed, "This would seem to require no comment." The incident is, however, an interesting example of how far conservative groups—normally quick to resent "government interference"—are willing to go in a case like this.

From the viewpoint of defendant, this case suffered as a test case from two additional circumstances. While the argument for minimum building-size regulations would at least be better in a small and fancy suburb, the implications of such regulations when applied over an area of 25 square miles of sparsely settled countryside were all too evident. Moreover, such requirements make particularly little sense in an area widely developed with summer cottages.

Residential versus Non-Residential Zoning

In *Mundelein Estates* v. *Village of Mundelein*, 99 North Eastern (2d) 144 (Illinois, 1951), the Illinois Court upheld residential zoning on vacant land along one side of a heavily traveled U. S. highway, even though the opposite side of the street was zoned for business. Most of the area behind the frontage in question was developed for residential purposes. The opinion took great pains to emphasize that there is no rule of law requiring the same zoning on two sides of the same street:

> The *Forbes* case does not set any hard and fast rules as to the location of dividing lines along streets, and the decision was, as is true in all zoning cases, based on the peculiar facts of that case. The same facts do not exist here, nor are the properties and locations involved substantially similar. It is true, also, that some physical features of a street such as width, gradient, and its utilization by various means of transportation may make it desirable, reasonable and best, for public safety and convenience, that one side be zoned for residence purposes and the other side for commercial use.

Industrial Development Company Gets New Industry for Slater, Mo.

OFTEN a small town's best opportunity to get a large vacant building occupied is for the municipality or a holding company of civic-minded citizens to buy it or otherwise get control of it.

That is the conclusion of E. E. Silkenat, merchant of Slater, Mo., after heading a successful campaign to get an industrial occupant for a four-story frame soft-flour mill whose closing had economically hurt Slater, a town with a population of 3,500.

For a good many years, the mill had been a commercial asset to Slater, but the local owners sold to a metropolitan concern which closed the mill after a few years. A firm bought the building for storing grain in its 18,000 square feet of floor space.

Idle storage in a building that should be housing an industry which would employ local labor didn't suit Mr. Silkenat and seven other businessmen, so they started doing something about it through the Slater Industrial Development Company, a legal corporation formed three years ago with a capital of $50,000 to promote civic interests.

First they made a labor survey, and then a housing survey so they would have definite figures on those subjects. Then they got a selling price on the old mill. It was $25,000.

Now came the hard work. They sold new stock in the development corporation for $10 par value at 4% interest to raise the $25,000 purchase price. The campaign was thorough—not an individual, not an organization being overlooked as a potential purchaser. Women were drawn into the campaign through their social clubs and parent-teacher associations, men's lodges were asked to buy shares as units. The money was raised and the civic corporation took title to the property.

The search for a tenant started. It ended with the finding of a woodworking plant owner in another town, who was seeking a new location for expansion. This man, E. Harold, had a good business making dunnage for a Kansas City steel mill, crating material for a St. Louis firm, and making gun stocks, navy beds, and skids for merchandise goods. He owned the third largest saw mill in the state.

The Slater building exactly suited this plant owner, who desired to add furniture-making to his current profitable business.

He bought the building for $25,000 on a 10-year loan and moved in. The contract provides for semi-annual principal payments.

"We gave the new industry one concession," Mr. Silkenat said. "Interest payments need not start for three years although all of the interest must be paid in time."

The Harold wood-working plant acted as an industrial magnet for Slater. Since it started operation, two other wood-working plants have moved in.

The Slater corporation did nothing more about getting these last two industries than to welcome the owners when they came to town looking for locations along the railroad right-of-way.

Old Records—New Revenue Source for Philadelphia

CITY CONTROLLER JOSEPH S. CLARK, Jr., of Philadelphia, has discovered a new source of revenue for that municipality—selling old records as scrap paper in a good market.

He announced recently that City Hall is piled high with records which are of no further use and that the city could realize as much as $240,000 for them.

Controller Clark said that he had disposed of 3,335 cubic feet of useless records inherited when he took office last year. He turned over $3,567.32 to the city's treasury to prove his point.

"We have estimated," he said, "that there are 400,000 cubic feet of records in the custody of departments of the city and county government and that 60% of these could be disposed of by an intelligent system of record analysis.

"Based on present market prices for waste paper, such a program would bring a return of $240,000 to the city."

Clark said the records he disposed of weighed 60,000 pounds and took up a space of over 5,000 cubic feet. He said he planned to petition the courts for permission to dispose of approximately 1,500 cubic feet of additional records.

Before the records were sold as scrap paper the Pennsylvania Historical and Museum Commission selected 500 cubic feet of records which will be preserved for historical purposes.

Cigarette Tax in Colorado

Three Colorado municipalities have recently imposed a cigarette tax. Largest is Boulder (population 19,999) which enacted a two-cent tax expected to bring in $40,000 to $45,000 a year—largely to go for salary increases for city employees.

The need of money for street purposes influenced the Town of Newcastle (population 483) to impose a two-cent tax. Nucla (population 457) has enacted a three-cent per package tax. About 20 Colorado communities now have cigarette taxes in effect.

Check these DORRCO DISTRIBUTOR features

against high-rate trickling filter requirements

Distributors for high-rate trickling filters have to be *mechanically* right to handle heavy loadings. Check these mechanical features of the Dorrco Distributor against those of other units...

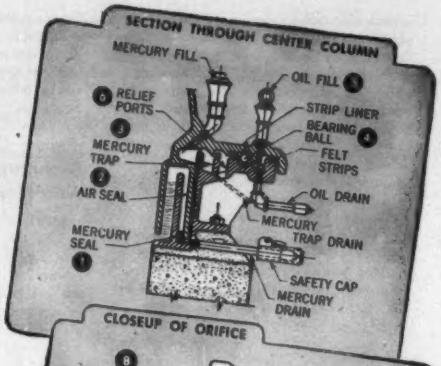
MERCURY SEAL... between rotating and fixed element (1) . . . is protected from contact with sewage by a positive air seal (2). In case of excess surge of pressure sufficient to blow the seal, the mercury is caught in an annular drain trap (3).

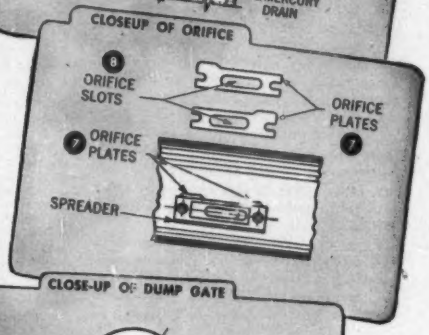
BEARINGS... Large diameter ball bearing race (4) running in oil at *base* of turntable for stability . . . is easily lubricated (5). Relief ports (6), provided for emergency overflow, prevent flooding of bearings under any circumstances.

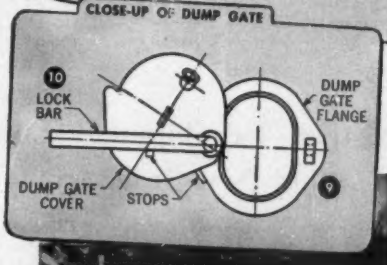
ADJUSTABLE ORIFICE PLATES... Two separate sliding plates (7) are bolted one upon the other to permit final flow adjustments. Orifice slots (8) are elongated to minimize clogging.

QUICK-OPENING DUMP GATE... provided at the end of each arm (9) is opened and closed easily by means of the lock bar (10).

Dorrco Distributors are available with two or four arms . . . having one or two compartments. On heavy duty units, the arms are of fabricated steel plate . . . tapered for better hydraulic performance and more uniform distribution. *The sum total of all these points is smooth Dorrco Distributor performance under the most severe of operating conditions.*







DORRCO

DORR

WORLD - WIDE RESEARCH · ENGINEERING · EQUIPMENT

THE DORR COMPANY · ENGINEERS · STAMFORD, CONN.

Offices, Associated Companies or Representatives in the principal cities of the world

Legal Notes and Decisions

Prepared by NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS
Charles S. Rhyne, General Counsel

Airports—Management of Ground Transportation

In action by county against town testing validity of town ordinance regulating ground transportation at airport in county, held that county as owner of airfield located in town had exclusive right to manage said airport including right to contract for ground transportation to be furnished airline passengers arriving or departing from airport. *Milwaukee County* v. *Town of Lake*, 48 N. W. (2d) 1 (Wis., May 8, 1951).

Bonds—Special Assessment—Mandamus Denied to Compel Preference in Payment

Where city council by ordinance appropriated sum out of unclaimed rebate fund in accordance with statute covering such fund and reserved right to allocate money to any one or more of purposes enumerated in statute, held mandamus would not lie to compel city council to pay money on plaintiffs' special assessment bonds and vouchers in preference to bonds and vouchers held by others in same class. *Lowenthal Securities Co.* v. *City of Chicago*, 98 N. E. (2d) 541 (Ill. App., Apr. 9, 1951).

City Employees—Earnings from Outside Employment Mitigate Damages

Where policemen and attendants of park district were wrongfully excluded from civil service positions, held that claims for salaries during wrongful exclusion would be reduced by their earnings from outside employment, since petitioners were not public officers so as to be entitled to salary irrespective of money earned in private employment. *Kelly et al.* v. *Chicago Park District*, 98 N. E. (2d) 738 (Ill., Mar. 22, 1951) *Reh. den.* May 21, 1951.

DDT Spray Damage—City Liability

In action against city to recover damages for destruction of personal property, held that city in spraying private houses with DDT solution was acting in governmental capacity and was not responsible for negligence of its employees. *City of Midland* v. *Hamlin*, 239 S. W. (2d) 159 (Texas Civ. App., Apr. 5, 1950).

Electric Wires—Municipal Liability

In action against city for wrongful death, held improper placing of wires carrying powerful current at a height above construction work less than that prescribed by statute was sufficient to justify imputation to city of negligence proximately causing death complained of. *Estick* v. *City of Lexington*, 65 S. E. (2d) 22 (N. C., May 23, 1951).

Gambling—Acts Outside City Limits Not Violation of Ordinance

Where defendants were convicted of keeping and participating in gambling house and gambling game for money in violation of city code, held, in reversing, that ordinance was not effective beyond city limits and not violated by acts committed outside corporate limits. *Murray* v. *City of Roanoke*, 64 S. E. (2d) 804 (Va., May 7, 1951).

Golf Course in City Park—Authority Of Park Commissioner to Lease

Where state legislature gave exclusive power to commissioners to lease, manage, and govern park, held injunction by taxpayer to restrain mayor from leasing right to operate golf course in city park of Philadelphia denied where commissioners received right to require lessee to reduce prices if unduly high and not in public interest and lessor city given right to terminate lease at end of any of first four years. *Cohen* v. *Samuel et al.*, 80 Atl. (2d) 732 (Pa., May 21, 1951).

Mandamus—Patrolman's Misstatement of Age in Applicatin —Civil Service Retirement

In mandamus to compel reinstatement to civil service list, held that writ properly denied where patrolman, when applying for position, knowingly misrepresented age at time of application and appointment and misstatement admittedly made to enable patrolman to retire on pension two years in advance of 65th year. *Waters* v. *Samuel et al.*, 80 Atl. (2d) 848 (Pa., May 23, 1951).

Milk—Ordinances Excluding Milk From City in Same State Invalid As Trade Barrier

Where city ordinances required inspection of plants, payment of inspection fees, and prohibited plant to receive milk from dairy not issued permit by city health officer, held as applied to plant in City of Houston which enforced rules promulgated by state health officer, ordinances were void as encroaching upon jurisdiction of other cities and setting up trade barrier in restraint of trade. *City of Port Arthur* v. *Carnation Co.*, 238 S. W. (2d) 559 (Texas Civ. App., Mar. 25, 1951).

Notice of Claim—Statute Requiring By Registered Mail

Where notice of claim of injury was mailed to comptroller of city and received by him and plaintiff was examined on claim, claim was not invalid because sent to comptroller by ordinary mail instead of registered mail as required by statute. *Drake* v. *Comptroller of City of New York*, 104 N. Y. S. (2d) 774 (N. Y. S. Ct., May 22, 1951).

Nuisance—Poultry Farm Within City

In action by city to enjoin defendant from violation of health regulation by operation of poultry farm within city, held that notwithstanding farming was permitted under zoning laws, defendant could not pursue vocation in manner which violated health regulations. *City of Waltham* v. *Mignosa*, 98 N. W. (2d) 495 (Mass., Mar. 30, 1951).

Off-Street Parking—Bonds for Invalidated

Where city adopted ordinance providing for off-street parking facilities and directing execution of mortage giving city's assets as security, held that ordinance was contrary to provisions of city charter since it empowered private trustee to hold and handle funds of facility. *McNichols* v. *City and County of Denver*, 230 Pac. (2d) 591 (Colo., Dec. 11, 1950). *Reh. den.* Apr. 30, 1951.

Parks—Conversion of Commons Into Playground

In action against city to enjoin construction of tennis courts on land alleged to have been dedicated as street or parkway, held evidence insufficient to show installation of tennis court was improper use of area. *Roach* v. *City of Tuscumbia*, 52 So. (2d) 141 Ala., Oct. 19, 1950).

Pensions—Power of City to Modify —Firemen and Policemen

In action against city for declaration of rights to pension under city charter, held that city had power to modify pension plan for firemen and policemen to provide that after effective date either entitled to retire might do so or not, but if he continued as employee, he could not earn any additional pension above that to which he was entitled on effective date of amendment. *Allstot* v. *City of Long Beach*, 231 Pac. (2d) 498 (Calif. App., May 25, 1951).

Policemen—Engaging in Outside Business

Where city policemen commenced business of selling alcoholic beverages under city license before civil service board adopted rule prohibiting employees from engaging in such business or other enterprises inconsistent with their duties as city employees, held that board's rule was valid; however, petitioner should be given reasonable time to dispose of business before enforcing rule against him. *Johnson* v. *Trader*; *Johnson* v. *City of Pensacola*, 52 So. (2d) 333 (Fla., May 4, 1951).

Sidewalks—Injuries from Fall On Ramp Outside Curb Line

In action against city for injuries sustained from fall on city-constructed curved pedestrian ramp leading from sidewalk to state highway, held that since highway department had delegated to city authority over areas outside curb lines of state highways in which area ramp was located, city was liable for negligent design and construction of ramp. *Cameron* v. *City of Gilroy*, 230 Pac. (2d) 839 (Calif App., May 8, 1951).

Street Railways—Liable to City For Five Per Cent of Cost of Grade Separation

Where city board of public works adopted resolution apportioning five per cent of cost of grade separation against street railway company, held that board was vested by statute with duty and power of apportioning cost of such project and company was liable for amount claimed. *Indianapolis Rys., Inc.* v. *City of Indianapolis*, 98 N. E. (2d) 505 (Ind., May 4, 1951).

Streets—Moving Building Over —Denial of Permit

Where city denied permit for plaintiff to move old army barracks over city streets, held that council acted within discretionary powers granted in city charter. *Nishkian* v. *City of Long Beach*, 230 Pac. (2d) 156 (Calif. App., Apr. 25, 1951).

Taxation—City Water System Outside City—Subject to Tax by County

Where city sought to recover from county taxes paid under protest on improvements to its water system located outside city limits, held that county properly assessed property at its current value after improvements had been made to water system under constitutional provision exempting only improvements which are wholly new structures. *City of Pasadena* v. *Los Angeles County*, 230 Pac. (2d) 801 (Calif., May 11, 1951).

Telephone Rates—Increase in Held Warranted

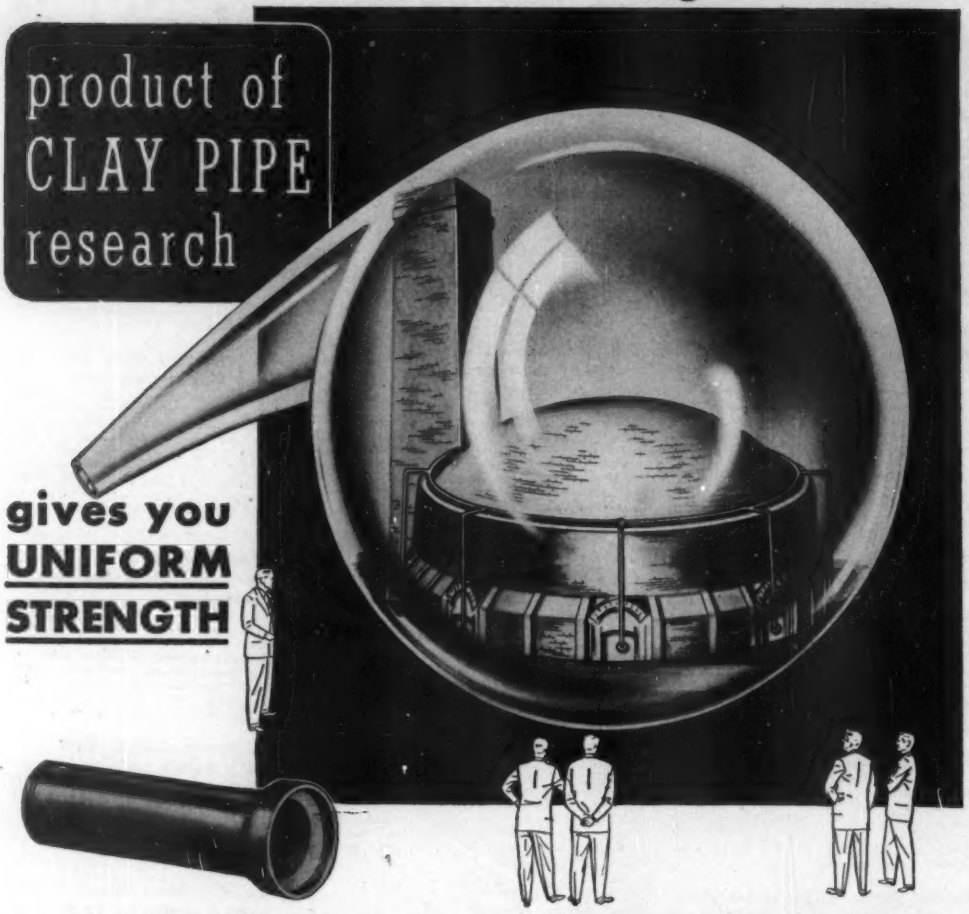
Where state corporation commission entered order increasing residence and business telephone rates and cities as intervenors appealed, held in affirming, that evidence warranted rate of return fixed by commission. *City of Norfolk et al.* v. *Chesapeake & Potomac Tel. Co.*, 64 S. E. (2d) 772 (Va. May 7, 1951).

Water Courses—Obstruction By Unfinished Dam

In action by farmer against city for damages to crops when canal maintained by city overflowed, held that city was liable since it permitted unfinished earthen dam to remain in canal and suffered trees, bushes, and weeds to grow over it to such extent that flow of water was obstructed. *City of Portsmouth* v. *Culpepper*, 64 S. E. (2d) 799 (Va., May 7, 1951).

controlled firing...

product of CLAY PIPE research



gives you **UNIFORM STRENGTH**

CONTROLLED FIRING . . . is a factor behind the *uniformity* of Vitrified Clay Pipe — whether it's one length, or a million. Electronic instruments correctly balance Clay Pipe firing time and temperature. This modern technology, harnessed to govern manufacturing processes, *improves* Clay Pipe's basic quality. Clay is chemically inert, completely unaffected by corrosion or the chemical wastes of modern industry. It's the *best* pipe for *your* sewerage or drainage projects.

NATIONAL CLAY PIPE MANUFACTURERS, INC.
100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
206 Connally Bldg., Atlanta 3, Ga.
703 Ninth & Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., S E. Long St., Columbus 15, Ohio

WRITE FOR DETAILED INFORMATION
Additional information and data on Vitrified Clay Pipe, Wall Coping and Clay Flue Lining sent FREE on request. State your specific questions. Simply contact the regional office nearest you.

Vitrified CLAY PIPE
CLAY PIPE NEVER WEARS OUT!

C-151-11

Recent City Manager Appointments

The following portraits are of city managers whose appointments have been announced in preceding issues of *The American City*

A. D. F. Bloodworth
Miami, Fla.

A. E. Fellers
Lapeer, Mich.

John Gold
Winston-Salem, N. C.

Clarence Elliott
Kalamazoo, Mich.

T. E. Chenoweth
Hutchison, Kans.

CORNELIUS BODINE, JR., has left Winter Park, Fla., and is now manager of Mountain Brook, Ala., succeeding ALVIN W. MORLAND.

The first manager of Laurinburg, N. C., is HERMAN E. DICKERSON, formerly administrative assistant at Charlotte, N. C.

JACK ELLIOTT left the city manager's office in Kansas City, Mo., to become the first manager of Hot Springs, S. D.

Titusville, Fla., chose J. FLOYD GLISSON to succeed H. G. FORRESTER as city manager.

The former superintendent of utilities at Lawrence, Kans., MAJOR C. HAGAR, has been appointed city manager of Sterling, Kans. He succeeds JOHN B. LADUEX.

WILLIAM L. KELL is the new city manager of Bluefield, W. Va., succeeding E. P. MITCHELL, who died in May.

HARRY B. MCDOWELL, a former division engineer for the State Highway Department, has been appointed by Chickasha, Okla., to fill the city manager position vacated by JOHN R. HAMMAN.

The new manager of Dunn, N. C., is OLIVER O. MANNING. He succeeds R. THOMAS HOBBS.

GORDON E. OLSON, former assistant to the city manager of Birmingham, Mich., has been appointed first manager of North St. Paul, Minn.

Greenville, S. C., has appointed its first city manager. He is GERALD W. SHAW, executive director of the Municipal Technical Advisory Service of the University of Tennessee.

BILL N. TAYLOR will move from Columbia, Mo., to become city manager of Wichita Falls, Texas. He takes over the position being vacated by FRANK WOOD.

J. B. MOBLEY, JR., has been succeeded by ROBERT M. TRACY as manager of Daytona Beach, Fla.

R. L. VANNOCKER will return to Albert Lea, Minn., as city manager, succeeding WARREN HYDE. Mr. VanNocker has recently been associated with the City of Eau Claire, Wis., but was formerly manager of Albert Lea from 1933-41.

W. T. WILLIAMSON, manager of Tucumcari, N. M., will move to Alaska to succeed IRVING H. CALL as manager of Fairbanks.

CLARENCE E. RIDLEY
Director
International City Managers' Association

Racine Library Answers TV Challenge

REALIZING that time is as big a challenge as television, the public library in Racine, Wis., has started a formal reading-rate improvement-course program designed to increase both the reader's reading speed and comprehension.

To offer the course, the library purchased five special reading-accelerator machines and textbooks from Science Research Associates. Also secured was a tachistoscope, which is a projector and flash peter designed to increase eye span and speed of perception. Mr. Joseph Logsdon, of the Illinois Institute of Technology Reading Service, was employed as instructor.

Instruction consists of work on the reading-accelerator machines, drill with the tachistoscope, watching special Harvard films, and taking a series of standardized reading and comprehension tests, with students competing against their own record, rather than against each other.

Practice work on the reading-accelerator machines forces the reader to hold a given speed, as a moving shutter prevents the eyes from re-reading lines, thus helping to untrain the often-found bad reading habit of "regression," or reading back over lines the eye has already seen. By flashing numbers and groups of words on the screen at a rate of 1/100 of a second, the tachistoscope trains the students to read phrases of words, instead of single words, at a glance.

Representative Municipal Bond Sales
September 4-12, 1951

Date of Sale		*Amount*	*Purpose*	*Average Maturity (Years)*	*Net Interest Cost Per Cent*
9- 4	Corpus Christi, Texas	$ 1,450,000	Var. Imp.	18-1/3	2.8397
9- 5	Killingly, Conn.	855,000	School	10	1.765
9- 5	Portsmouth, Va.	1,500,000	School	11-1/2	1.8673
9- 6	Florida Improvement Commission	21,250,000	Bridge Rev.	30	3.75
9- 6	Jefferson Co., Ala.	10,000,000	Sewer System	16-2/3	2.565
9- 6	Nassau Co., N. Y.	16,534,000	Var. Imp.	13-3/4	1.913
9-11	Appleton, Wis.	220,000	Vocat. School	5-1/6	1.357
9-11	Barnstable Co., Mass.	375,000	Sanatorium	8	1.36
9-10	Bristol, Pa.	400,000	Sewage Treat.	10-1/2	1.617
9-11	Chatham Co., Ga.	2,500,000	Var. Imp.	16-5/6	2.064
9-11	Imperial Irrigation Dist., Cal.	6,500,000	Electric Rev.	20-1/6	2.9547
9-11	Richmond Co., N. C.	750,000	School	13-5/6	2.059
9-12	Hoboken, N. J.	877,000	School	10-1/4	2.294

Cayuga Rock Salt

NATURE'S PURE PRODUCT—Mined 2000 Feet Below Historic Cayuga Lake

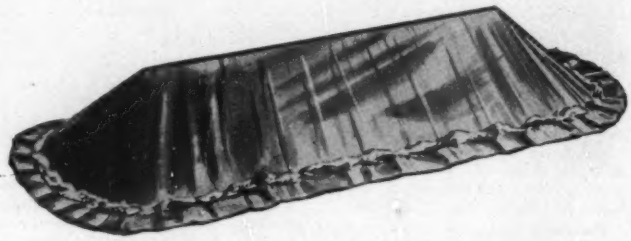
HERE IS A FASTER and CHEAPER METHOD OF ICE AND SNOW CONTROL:

Apply CAYUGA ROCK SALT in a thin, wide "bird shot" melting pattern. Get the salt on the road early in the storm before snow becomes compacted and frozen. Each salt pellet goes to work immediately, full width of the road, keeping the snow in a soft, mealy workable condition.

The Tarco "Scotchman" Salt Spreader is ideally suited for the correct application of Cayuga Rock Salt. Depending on storm conditions if you will apply from 300 lbs. to 400 lbs. of Cayuga Rock Salt per mile of road—full width—you will be amazed at how fast you obtain BARE, SAFE pavements. This light, thrifty "Scotchman" salt application assures maximum melting with the absolute minimum of salt. No highway department that has once used 100% Cayuga Rock Salt for winter road maintenance has ever gone back to sand or cinders.

TARCO "Scotchman" Salt Spreader

STORE IT UNDER SENSATIONAL NEW RAYN-SHED



Pile your Rock Salt on any hardened surface—such as an abandoned strip of road, or on tar paper —then cover it easily and quickly with RAYN-SHED.

WHAT IS RAYN-SHED?

RAYN-SHED is a durable, watertight, weather-resistant vinylite plastic sheet, carefully sewed into large strips, which in turn may be cemented together on the job to form even larger coverings as your salt pile grows. Sizes are standardized, so that easily made combinations will cover bulk salt piles of 2 to 20 carloads. RAYN-SHED is equally suitable to use over piles of bag salt.

CAYUGA ROCK SALT CO., INC., MYERS, N. Y.

SIZES FOR ALL PURPOSES — *Call Nearest Distributor* — **BULK OR BAGS**

W. H. SHURTLEFF CO.
2½ Union Wharf,
Portland 3, Maine
Telephone 2-7461
also
Dutton Street, Bangor, Maine
Telephone 7993

BARNES SALT COMPANY
Corner Benefit and India Streets
Providence, Rhode Island
Telephone Dexter 1-7379

SOUTHERN SALT COMPANY
222 West Main Street
Norfolk, Va.
Telephone 2-4838

THE CHEMICAL CORPORATION
54 Waltham Ave., Springfield 5, Mass.
Telephone 9-5801

Warehouses:
Pittsfield, Mass.
Telephone 2-0718
Boston, Mass.—30 Boylston St.
Telephone Liberty 2-7171
Hartford, Conn.
Telephone 6-8232
Concord, N. H.
Telephone 2304
New Haven, Conn.
Telephone 8-3627

CHAS. SCHAEFER & SON, INC.
304 Mesereis Street, Brooklyn 6, N. Y.
Telephone Hyacinth 7-2460

CHAS. SCHAEFER & SON, of N. J., Inc.
Pownley, N. J.
P. O. Box 236, Elizabeth, N. J.
Telephone Elizabeth 2-7010

KERR SALT COMPANY
930 North Delaware Ave.,
Philadelphia 23, Pa.
Telephone Market 7-4004

KERR SALT COMPANY
901 South Wolfe Street,
Baltimore 31, Md.
Telephone Wolfe 0282

E. J. FEDIGAN, INC.
Anderson & Isabella Streets
N. S. Pittsburgh 12, Pa.
Telephone Cedar 1-6766

WATKINS SALT CO.
Watkins Glen, N. Y.
Telephone 13

YOUNGSTOWN BUILDING MATERIAL & FUEL CO.
1505 Logan Avenue
Youngstown 4, Ohio
Telephone 3-4101

OBRECHT SALT COMPANY
237 President St.,
Baltimore 2, Md.
Telephone Saratoga 2370

INDUSTRIAL SALT SERVICE
A Division of Highway Materials Co., Inc., Groton, N.Y.
Telephone Groton 154

Branch Warehouses:
Congers, Rockland Co., N. Y.
Niagara Falls, N. Y. (Lehigh Valley R.R. Co. Roundhouse)

A. F. NILSON, Sales Engineer
12 Mercer Ave., Chatham, N. J
Telephone Chatham 4-7008

Conventions — When and Where

Conventions listed this month for the first time are indicated by an asterisk (*)

Oct. 14-17—Fort Worth, Texas
AMERICAN WATER WORKS ASSOCIATION—Southwest Section. Annual Convention (Texas Hotel). Sec.-Treas., Leslie A. Jackson, Robinson Memorial Auditorium, Little Rock, Ark.

Oct. 14-17—Pittsburgh, Pa.
AMERICAN SOCIETY OF PLANNING OFFICIALS. Annual Convention (Hotel William Penn). Exec. Dir., Walter H. Blucher, 1313 E. 60th St., Chicago 37, Ill.

Oct. 14-17—San Francisco, Calif.
LEAGUE OF CALIFORNIA CITIES. Annual Convention. Exec. Dir., Richard Graves, Hotel Claremont Bldg., Berkeley 5, Calif.

Oct. 15-17—Portland, Ore.
LEAGUE OF OREGON CITIES. Annual Convention (Multnomah Hotel). Exec. Sec., Herman Kehrli, Johnson Hall, University of Oregon, Eugene, Ore.

Oct. 15-18—Toronto, Canada
ASSOCIATION OF SCHOOL BUSINESS OFFICIALS. Annual Convention (Hotel Royal York). Sec., H. W. Andersen, 306 E. Lovell St., Kalamazoo, Mich.

Oct. 16-17—Little Rock, Ark.
ARKANSAS MUNICIPAL LEAGUE. Annual Convention (Hotel Marion). Exec. Dir., Glenn G. Zimmerman, 401 Main St., N. Little Rock, Ark.

Oct. 18-19—Youngstown, Ohio
STREET MAINTENANCE AND SANITATION OFFICIALS OF OHIO. Fall Meeting (Hotel Pick). Pres., Robert E. Willems, 604 Municipal Bldg., Akron 8, Ohio.

Oct. 18-20—Peoria, Ill.
ILLINOIS ASSOCIATION OF PARK DISTRICTS. Annual Convention (Hotel Jefferson). Exec. Sec., Miss Marjorie Dickinson, 621 E. Capitol St., Springfield, Ill.

***Oct. 18-20—Reading, Pa.**
LEAGUE OF CITIES OF THE THIRD CLASS IN PENNSYLVANIA. Annual Convention. Sec., Chester E. Rogers, City Clerk, Easton, Pa.

Oct. 21-24—Mineral Wells, Texas
LEAGUE OF TEXAS MUNICIPALITIES—jointly with eight affiliated organizations. Annual Convention (Baker Hotel). Exec. Dir., E. E. McAdams, 108 E. 19th St., Austin 1, Texas.

Oct. 21-24—Washington, D. C.
NATIONAL INSTITUTE OF GOVERNMENTAL PURCHASING. Annual Conference and Exhibit (Shoreham Hotel). Exec. Dir., Albert H. Hall, 730 Jackson Place, NW., Washington 6, D. C.

***Oct. 22-24—Columbia, Mo.**
DIESEL POWER PLANT CONFERENCE. Annual Conference (University of Missouri). Professor R. T. Quick, Engineering Bldg., University of Missouri, Columbia, Mo.

Oct. 22-24—Pittsburgh, Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA. Annual Water Conference (Hotel William Penn). Sec., W. M. Porter, Engineers' Society of Western Pennsylvania, Hotel William Penn, Pittsburgh 30, Pa.

Oct. 23-26—Atlantic City, N. J.
PENNSYLVANIA'S WATER WORKS ASSOCIATION. Annual Meeting (Claridge Hotel). Pres., John H. Murdoch, Jr., 121 S. Broad St., Philadelphia 7, Pa.

Oct. 23-26—Omaha, Nebr.
AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual Meeting (Fontanelle Hotel). Exec. Sec., Hal H. Hale, 917 National Press Bldg., Washington 4, D. C.

Oct. 23-26—San Francisco, Calif.
AMERICAN WATER WORKS ASSOCIATION—California Section. Annual Convention (Fairmont Hotel). Sec.-Treas., William W. Aultman, P. O. Box 38, La Verne, Calif.

Oct. 24-26—Winston Salem, N. C.
NORTH CAROLINA LEAGUE OF MUNICIPALITIES. Annual Convention (Hotel Robert E. Lee). Exec. Sec., Mrs. Davetta L. Steed, 1009 Raleigh Bldg., Raleigh, N. C.

Oct. 25-27—Dubuque, Iowa
AMERICAN WATER WORKS ASSOCIATION—Iowa Section. Annual Convention (Hotel Julien). Exec. Sec., H. V. Pedersen, Marshalltown Water Works, Marshalltown, Iowa.

Oct. 25-27—Atlantic City, N. J.
AMERICAN WATER WORKS ASSOCIATION—New Jersey Section. Annual Fall Meeting (Hotel Madison). Sec., C. B. Tygert, Box 178, Newark, N. J.

Oct. 26-27—Fall River, Mass.
MASSACHUSETTS FEDERATION OF PLANNING BOARDS. Annual Meeting (Mellen House). Sec., Ralph W. Horne, 11 Beacon St., Boston, Mass.

Oct. 28-31—Daytona Beach, Fla.
FLORIDA SEWAGE AND INDUSTRIAL WASTES ASSOCIATION, jointly with the Florida Section of the AMERICAN WATER WORKS ASSOCIATION. Annual Fall Meeting (Princess Issena Hotel). Sec.-Treas., Perry M. Teeple, P. O. Box 210, Jacksonville 1, Fla.

Oct. 28-30—Kansas City, Kans.
KANSAS ASSOCIATION OF MUNICIPAL UTILITIES. Annual Convention (Town House). Sec., Edgar P. Schowalter, Board of Public Utilities, Kansas City 6, Kans.

***Oct. 28-30—Kodiak, Alaska**
LEAGUE OF ALASKAN CITIES. Annual Convention. Exec.-Sec., Arthur H. Rosien, Box 400, Anchorage, Alaska.

Oct. 28-Nov. 1—Miami, Fla.
INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE. Annual Convention (McAllister Hotel). Exec. Sec., Edward J. Kelly, 1424 K St., NW., Washington 5, D. C.

Oct. 29-Nov. 2—San Francisco, Calif.
AMERICAN PUBLIC HEALTH ASSOCIATION. Annual Convention (Civic Auditorium). Exec. Sec., Reginald M. Atwater, M.D., 1790 Broadway, New York 19, N. Y.

Oct. 31-Nov. 2—Baltimore, Md.
AMERICAN WATER WORKS ASSOCIATION—Chesapeake Section. Annual Convention (Hotel Belvedere). Sec.-Treas., C. J. Lauter, 6955 33rd St., NW., Washington, D. C.

Nov. 7-9—Roanoke, Va.
AMERICAN WATER WORKS ASSOCIATION—Virginia Section. Annual Convention (Hotel Roanoke). Sec.-Treas., W. H. Shewbridge, State Health Dept., State Office Bldg., Richmond, Va.

Nov. 12-14—Winston-Salem, N. C.
AMERICAN WATER WORKS ASSOCIATION—North Carolina Section—and NORTH CAROLINA SEWAGE AND INDUSTRIAL WASTE ASSOCIATION. Annual Convention (Hotel Robert E. Lee). Sec.-Treas., (AWWA), E. C. Hubbard, State Board of Health, Raleigh, N. C.

Nov. 12-16—Miami, Fla.
AMERICAN INSTITUTE OF PARK EXECUTIVES. Annual Convention (McAllister Hotel). Exec. Sec., Weldon B. Wade, 30 N. LaSalle St., Chicago 2, Ill.

Nov. 25-28—Cincinnati, Ohio
NATIONAL ASSOCIATION OF CIVIC SECRETARIES. Annual Convention (Netherland Plaza Hotel). Pres., Ronald E. Grezz, 417 Huron St., Toledo 4, Ohio.

Nov. 25-28—Cincinnati, Ohio
NATIONAL MUNICIPAL LEAGUE. Annual Convention (Netherland-Plaza Hotel). Exec. Sec., Alfred Willoughby, 299 Broadway, New York 7, N. Y.

Nov. 25-30—Atlantic City, N. J.
AMERICAN SOCIETY OF MECHANICAL ENGINEERING. Annual Meeting (Radisson Hotel). Exec. Asst. Sec., Ernest Hartford, 29 W. 39th St., New York 18, N. Y.

Nov. 26-27—Prescott, Ariz.
ARIZONA MUNICIPAL LEAGUE. Annual Meeting (Hassayampa Hotel). Exec. Sec., Joseph C. Furst, 15 S. First Ave., Phoenix, Ariz.

Nov. 26-29—Dallas, Texas
NATIONAL TAX ASSOCIATION. Annual Convention (Hotel Adolphus). Sec., Ronald B. Welch, Box 1799, Sacramento, Calif.

Nov. 27-30—Atlantic City, N. J.
NEW JERSEY STATE LEAGUE OF MUNICIPALITIES. Annual Meeting (Hotels Traymore and Claridge). Exec. Dir., James J. Smith, 603 Trenton Trust Bldg., Trenton 8, N. J.

Nov. 29-Dec. 1—New York, N. Y.
NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS. Annual Meeting (Hotel Roosevelt). Exec. Dir., Charles S. Rhyne, 730 Jackson Pl., NW., Washington, D. C.

Nov. 29-Dec. 1—Washington, D. C.
AMERICAN PUBLIC WELFARE ASSOCIATION. Annual Meeting (Statler Hotel). Dir., Louis Dunn, 1313 E. 60th St., Chicago 37, Ill.

***Dec. 6—Stillwater, Okla.**
OKLAHOMA WATER, SEWAGE, AND INDUSTRIAL WASTES CONFERENCE. Annual Meeting and Short Course (Student Union, Oklahoma A & M College). Exec. Sec., H. J. Darcey, 3400 North Eastern, Oklahoma City, Okla.

***Dec. 7-8—Annapolis, Md.**
MARYLAND MUNICIPAL LEAGUE. Annual Meeting (Carvell Hall). Exec. Sec., Joseph M. Ray, Box 276, College Park, Md.

Dec. 10-12—Washington, D. C.
AMERICAN MUNICIPAL ASSOCIATION. Annual Convention (Statler Hotel). Exec. Dir., Carl H. Chatters, 1313 E. 60th St., Chicago 37, Ill.

***Jan. 15-18—Washington, D. C.**
HIGHWAY RESEARCH BOARD. Annual Meeting (Natl. Academy of Science Bldg.). Acting Dir., Fred Burggraf, 2101 Constitutional Ave. NW., Washington 25, D. C.

***Jan. 17-18—New York, N. Y.**
NEW YORK SEWAGE AND INDUSTRIAL WASTES ASSOCIATION. Annual Meeting (Statler Hotel). Exec. Sec., R. C. Sweeney, New York State Health Dept., 21 Broadway, White Plains, N. Y.

Jan. 21-24—Houston, Texas
AMERICAN ROAD BUILDERS' ASSOCIATION. Annual Meeting (Rice Hotel). Exec. Vice-Pres., Lt. Gen. Eugene Reybold, International Bldg., Washington 4, D. C.

***Jan. 27-31—Chicago, Ill.**
ASSOCIATED EQUIPMENT DISTRIBUTORS. Annual Convention (Stevens Hotel). Exec. Sec., P. D. Hermann, 360 North Michigan, Chicago, Ill.

***Jan. 28-30—Cincinnati, Ohio**
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS. Annual Meeting (Netherlands Plaza Hotel). Sec.-Treas., W. K. Parr, Box 376, Ann Arbor, Mich.

***Feb. 25-28—Detroit, Mich.**
ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. Annual Meeting (Statler Hotel). Managing Director, H. E. Foreman, 1227 Munsey Bldg., Washington, D. C.

***Feb. 27-March 1—Milwaukee, Wis.**
COMMUNITY CHESTS AND COUNCILS OF AMERICA, INC. Bi-Annual Meeting (Hotel Schroeder). Exec. Dir., Ralph H. Blanchard, 155 E. 44th St., New York 17, N. Y.

!March 5-7—Atlantic City, N. J.
ASSOCIATION OF HIGHWAY OFFICIALS OF THE NORTH ATLANTIC STATES. Annual Convention (Traymore Hotel). Sec.-Treas., A. Lee Grover, 1035 Parkway Ave., Trenton, N. J.

***March 9-13—College Station, Texas**
TEXAS WATER AND SEWAGE WORKS ASSOCIATION. Annual Meeting (Texas A & M College). Sec., V. M. Ehlers, 501 W. 33rd St., Austin, Texas.

(Continued on page 000)

ARCTIC TO TROPICS

COAST TO COAST

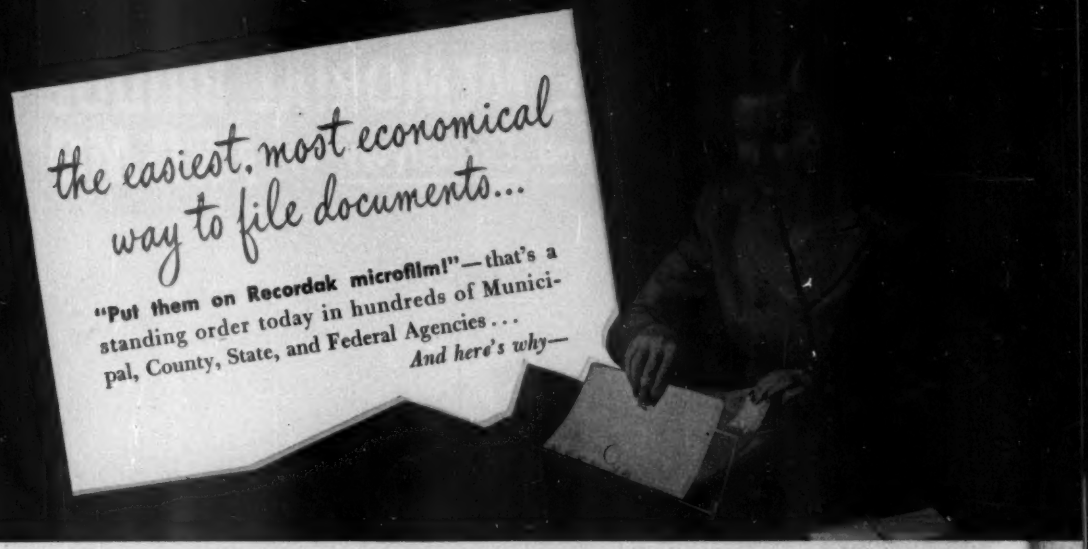
DUALS simplify parking control!

PICTURED here are four of the hundreds of progressive cities from Canada to the Gulf, from the Atlantic to the Pacific, that chose Dual Automatic Parking Meters. They found by comparison—by evaluating Duals' many advantages—that Duals offer more dependable, more efficient parking control in any climate . . . in all kinds of weather.

Plus that—Duals give economical service, too. For in case after case, records show remarkably low maintenance—steady, high revenue.

Find out how much more *Duals* have to offer your community—Dual *Gearshift* Automatics that permit instant time and coin conversions. Send for Bulletin DU-504 for on-street parking; Bulletin DU-505 for off-street parking.

THE DUAL PARKING METER COMPANY
A subsidiary of The Union Metal Manufacturing Company
Canton 2, Ohio


the easiest, most economical way to file documents...
"Put them on Recordak microfilm!"—that's a standing order today in hundreds of Municipal, County, State, and Federal Agencies...
And here's why—

- **You can "file" documents so easily** . . . getting photographically accurate and complete records—on 16 or 35mm film—in a second or less.
- **You can do it so economically.** Imagine being able to photograph documents for a fraction of a cent apiece . . . getting thousands of picture-perfect records on a compact roll of microfilm that's no larger than the palm of your hand . . . that can be filed in as little as 1% of the original storage space. This simplifies reference, too . . . for you can keep your microfilm records at your finger tips . . . review them quickly . . . whenever needed . . . in the Recordak Film Reader, which enlarges every detail to convenient reading size.
- **In addition, you get "bound volume" protection** against the misfiling of individual documents. Furthermore, your Recordak microfilm copies can't be altered without detection . . . can be vault-stored, if you wish, for maximum protection against fire, loss, theft.

Typical cross section of documents now being "filed" on Recordak microfilm

Archive documents	Deeds
Assignments	Employee benefit slips
Authorization records	Engineering drawings
Automobile registrations	Income tax returns
Bank examination reports	Medical case-history records
Bonds	Misc. file records
Building permits	Mortgages
Cancelled checks	Papers of incorporation
Census records	Payroll and time receipts
Charters	Purchase records
Civil service examination papers	Rare library volumes
Contracts	Sales tax returns
Corporate filings	Vital statistics
Daily police reports	Vouchers
Decrees admitting wills to probate	Water tax receipts
	Wills

Write today for information on the complete line of Recordak microfilmers *now offered on an attractive purchase or rental basis.* Recordak Corporation (*Subsidiary of Eastman Kodak Company*), 444 Madison Ave., New York 22, N. Y.

"Recordak" is a trade-mark

RECORDAK

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming—and its application to government routines

The DELAWARE MEMORIAL BRIDGE

Serviced & Reflectorized Exclusively by **PRISMO**

NOTHING EQUALS PRISMO ... BUT PRISMO ...

As further proven through the exclusive use of Prismo, the finest reflective traffic paint in all the world, on the new Delaware Memorial Bridge. The complete Prismo service and supervisory personnel, marking equipment, and traffic paint, makes the newest bridge . . linking great highways . . . the safest bridge, night and day.

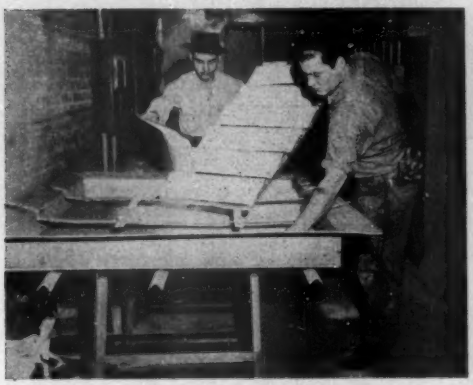
For "Start to Finish" traffic marking . . . PAGE PRISMO! Save time . . . Save money, by turning your traffic marking problems over to Prismo. We are currently reflectorizing the new extensions of the famous Pennsylvania Turnpike and ultra-modern New Jersey Turnpike.

Write today for complete information on Prismo "Start to Finish" traffic marking

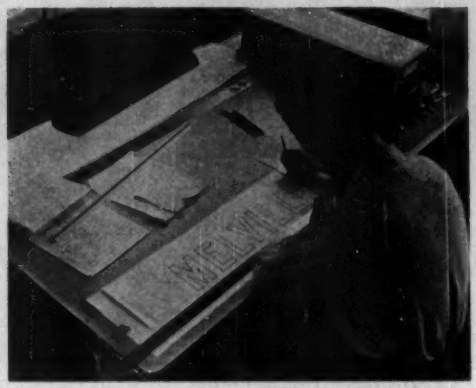
PRISMO SAFETY CORPORATION

HUNTINGDON, PENNA.

Detroit's Street Names Always Bright



To produce a reflective background, the blank signs are first sprayed on one side with a special binder. While it is still wet, glass beads are poured over the blanks, and they are run through the drying oven once more.



Here an artist is working on lettering. The first step in transferring the name of the street onto the sign is to make a layout of the letters on paper. The best results were obtained with a 4-inch Series C+ alphabet.

THE City of Detroit is now completing the second quarter of a four-year street-name sign program aimed at replacing all the existing embossed wood signs with reflectorized metal signs.

The decision to make the change to steel signs was based on studies which showed that a better, more attractive sign could be produced, installed, and maintained with greater ease and at less cost than the former wooden signs.

By FRANK A. RONAN
Senior Assistant Traffic Engineer
Detroit, Mich.

The chief factor influencing the appearance of the sign was the fact that the entire background of the sign can be reflectorized with glass beads. Although it was possible to have reflectorized letters on the wood signs when first installed, the surface was difficult to maintain. In addition, it has been found that on such small signs the reflected background gives much greater nighttime visibility than individual letter reflection.

By switching to the steel signs, the city was able to produce its own signs rather than purchase them. The Traffic Engineering Bureau had, through the years, built up a shop for producing its own metal traffic signs. It was a relatively simple matter to extend these

Street names are cut into the stencil film from the paper layout, and the cut film is impregnated into a framed silk screen. At right is the finished product.

36,306 PARKING METERS of OTHER MAKES have been REPLACED by PARK-O-METERS

That's right!

In 106 cities
36,306 Park-O-Meters have
been purchased to replace
meters of other makes.

85 TO 1 PREFERENCE

In only 3 cities have
Park-O-Meters been
replaced by other
makes. And in these
3 cities only 425 units
were replaced. This is

PROOF OF OVERWHELMIN[illegible]ENCE

Ask us to show you why . . .

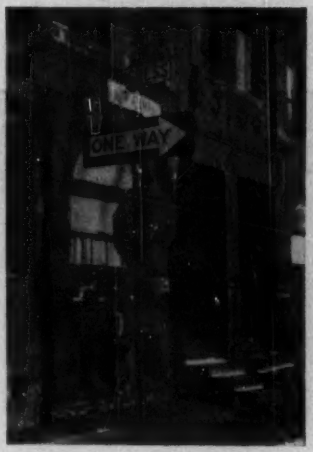
facilities into street-sign production.

Instead of carrying a large stock-pile of replacement signs and being dependent on the ability of an outside supplier for signs not in the stock-pile, the city can now repair or replace signs as soon as the need arises.

Upkeep

Maintenance of the wood signs was a slow, indefinite process of sending out a crew of painters to "brighten" the signs on location by first painting the entire sign black—letters and all. This meant that entire areas would have blacked-out signs for anything from a few days to weeks depending on when the follow-up crew could come along and apply white paint to the embossed letters with rollers. It is this method of maintenance that, as mentioned before, makes it difficult to maintain a reflective surface on the embossed letters of signs made from wood.

In contrast, the maintenance program for the metal signs will be a complete replacement of the signs every four years. As stated in the first part of this article, the original change-over was based on a four-year program. After the last section is completed in the fourth year, the replacement of the first section will start in the fifth year. This method of maintenance assures the utmost in appearance as well as a continuous high degree of reflectivity for night-time visibility.



With street signs and traffic signs controlled by the same city department, advantage can always be taken of combined installation.

84-Car Metered Lot Opened In Pomona, Calif.

By F. W. SHARP
Administrative Officer
Pomona, Calif.

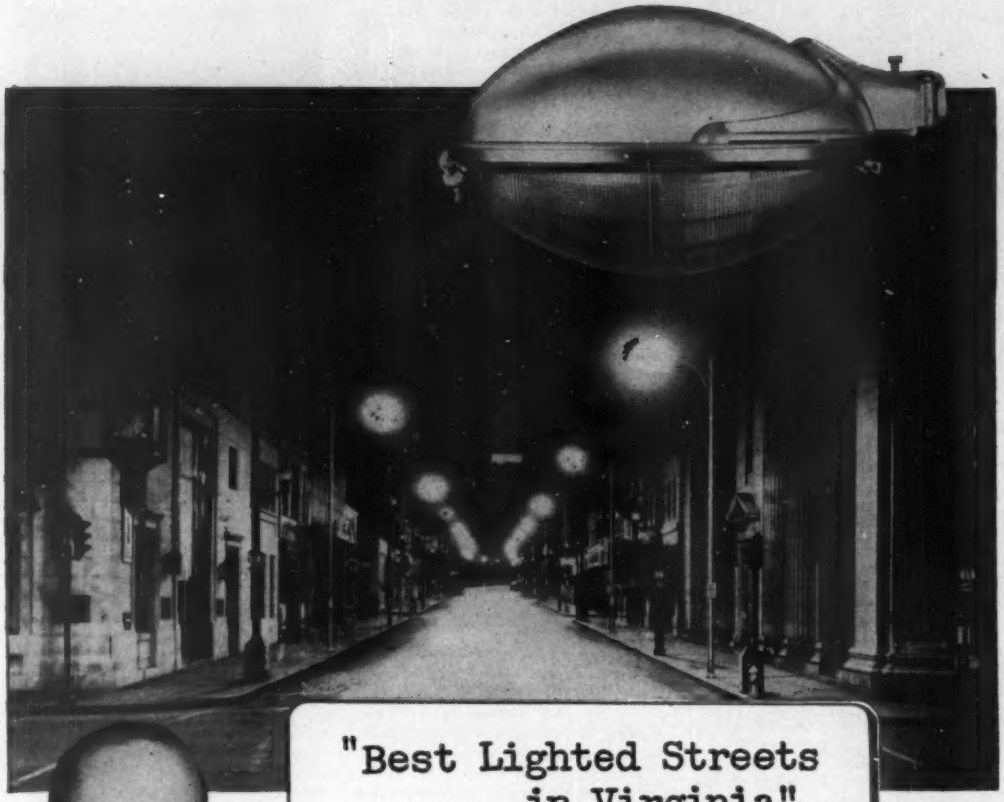
WITH band, searchlight, and welcoming words, Mayor Alan G. Orsborn accepted for the City of Pomona, Calif., a new 84-car metered and lighted parking lot. Located on 1st Street, between Thomas and Main, its $90,000 cost was paid by assessments on property owners of Parking District No. 1. Future parking improvements within the district will be paid by revenues from the meters which are Magee-Hale Park-O-Meters with counters. The counters facilitate collection and accounting of the parking-lot coins, making it unnecessary for us to collect separately from street meters. Rates are two cents for 12 minutes and five cents for one hour.

This was the first successful proceeding under the Parking District Act of 1943 in California. Several other lots in the downtown section are being acquired under the same Act which provides for the formation of a vehicle parking district, administered by a three-man board of parking commissioners with power to acquire and lease properties, levy and collect limited taxes, and operate the parking places acquired for the benefit of the district. The board serves the district, but all transactions are handled in the name of the city. Any member may be removed from office by a 4/5 vote of the legislative body or by petition signed by the owners of one-half of the area of assessable land within the district. The Act permits parking-meter revenue to be used to aid the district. Also, upon petition of owners of 50% of the assessed value of taxable land, one commission may operate several or all of the parking places located within the city.

The 1943 Act has many provisions to encourage off-street parking, the theory being that if each district provides its own permanent off-street parking the downtown off-street parking problem will be solved.

It keeps the City Council out of the crossfire of competitive landowners and conflicting interests. The City Council, in attempting to determine the proper location for off-street parking, can only be the scapegoat for the wrath of everyone. Where shall the lots be located? Shall lots be paved and lighted? Shall parking meters be installed? Shall multiple-level parking in a congested business area be instituted, or should parking lots in the outlying areas be purchased instead? Even after careful studies by planning experts gathering facts from the shoppers themselves as to their habits, how far they would walk, etc., parking lots have been mislocated or not used for the purpose intended. With the formation of a small compact district, there is no problem for the Council. The parking district commissioners decide what is best for the district and work toward that goal. If they make errors, they can be corrected without the entire city's becoming embroiled in the dispute.

Pomona's new municipal parking lot was quickly taken over by local shoppers.



"Best Lighted Streets in Virginia"

City Manager, Arthur Owens, Roanoke, Virginia, points with pride "to the first large-scale application of truly modern lighting in the Southeastern United States." The Westinghouse OV-20 mercury vapor lighting system, installed by the Appalachian Electric Power Company, is making a hit with the citizens:

"We have already ordered a sizable extension to relight our secondary business streets, and we believe that universally favorable response to this lighting system will eventually lead to installation of hundreds of similar units on our arterial approaches, bridges and viaducts."

Arthur J. Owens

What's more, they have invested in a system that is easy to maintain. Hinged construction of the OV-20 makes routine cleaning a matter of minutes. Relamping can be done with one hand.

Whether you buy lighting, install lighting or plan lighting, it will be worth your while to investigate the Westinghouse mercury vapor lighting story. Send for B-3876A, Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

J-04302

YOU CAN BE SURE... IF IT'S Westinghouse

PLANNED LIGHTING SYSTEMS

Transit Vehicles Essential to Reduce City Traffic Congestion

IT HAS often been said in this magazine that mass-transportation vehicles are essential to reduce the number of cars on the street. Traffic signals and pavement markings control and facilitate traffic; parking meters and off-street space organize parking. City transit regularly carries many passengers who otherwise would use automobiles.

Just how true this is as a claim, as an actuality, and in amount of traffic reduction, was established by the 59-day strike of the 3,700 operators of the Detroit, Mich., Department of Street Railways. Before the strike, 117,000 cars, plus transit vehicles, brought an average of 404,000 people into the city daily. During the strike 153,000 cars brought only 342,000 into the downtown area.

City Director of Traffic James A. Hoye reported a 33% increase in traffic and a 44% rise in accidents during the strike, compared with the same non-strike period a year ago. Had the strike occurred in winter, instead of in favorable weather, the difficulties of Detroit citizens might have been considerably greater.

Detroit has been trying to find a solution to its traffic problem for many years. Detailed engineering studies have been made and elaborate reports issued. They have been examined, approved, and passed, but the traffic congestion remains. Somehow they don't seem to burrow down to the final equation. New York City without subways would doubtless be in the same fix.

It's All on the Surface in Detroit

In Detroit, all movement of the people, whether by private vehicles or public transit vehicles, must take place on the surface streets. The resulting traffic congestion means simply that the amount of street space available is insufficient to accommodate the number of vehicles involved.

Streets have been widened; "through" traffic streets, one-way streets, and reversible lanes have been established; more and more traffic signals have been added; left and right turns prohibited, and street parking eliminated, but traffic congestion has continued to become progressively worse.

Vehicular expressways are now proposed. While these may relieve in some measure the present traffic situation, their vehicle-carrying capacity is limited, only a few of them can be afforded, and they tend to invite more traffic into the central business district where parking space is expensive and very limited. The expressways cannot be a solution, but only a further expedient in the attempt to provide for the ever-increasing traffic.

Freeways

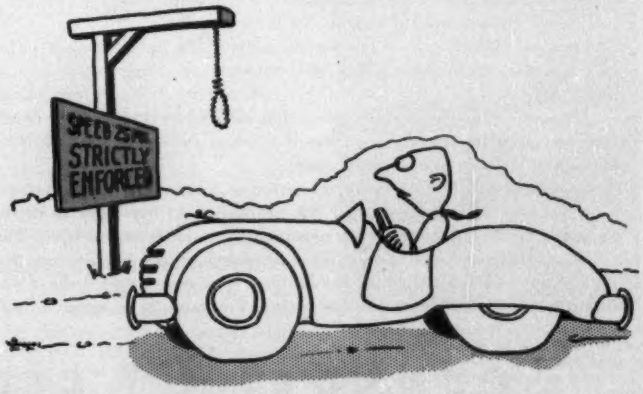
Not only Detroit, but other large cities as well, will doubtless give increasing consideration to coordinating public transportation with freeways. For instance, it is said that center malls for a doubletrack rapid-transit can be obtained, with the addition of about one-tenth the cost of the freeway. The subject and method are discussed in two reports: *Urban Freeways*, published by the American Transit Association, 292 Madison Ave., New York, and *Rapid Transit Plan for Metropolitan Detroit* (1949) prepared by Dr. Thomas Conway, Fidelity Philadelphia Building, Philadelphia, Pa., for the Rapid Transit Commission of the City of Detroit. The latter report reminds that "Expressways are built to transport people; the vehicles used for this purpose are incidental to the transportation of people."

The basic problem is moving people. The "prime mover" from the standpoint of street relief is a rail rapid-transit system capable of moving large numbers of people through entirely separate channels free from interference from other types of traffic. At the same time, such facilities would tend to reduce traffic congestion by removal of a great many vehicles from the surface streets. This system would become the backbone of the Detroit Street Railways whose lines would largely become feeders to the rapid-transit operation.

In the opinion of the Civic Affairs Committee of the Engineering Society of Detroit, such a system must include short subways in the downtown area so that the service can penetrate the very heart of the central business district where the greatest daily concentration of people occurs. Outside this district, the system must operate on an exclusive right-of-way, preferably in the center mall of the expressway. Such provision should be made. Only rapid transit will take masses of people off the streets and roadways, and carry them with the speed necessary to winning and holding passengers who otherwise would be in automobiles adding to the congestion and confusion.

Trafficones Easy for Workers and Traffic

AN asphalt-patching job was completed on August 31, 1951, on both sides of Broadway at Park Place opposite New York's City Hall. On one side of the street were a Littleford tool wagon and heater and a Buffalo-Springfield steam roller. Perhaps the most interesting item was the way the equipment and the most recent patch, on the opposite side of Broadway, were protected from traffic. Instead of strings of sawhorses and red flags, there were six Trafficones, three placed on one side of the street and three on the other. They were treated with as much respect by the drivers as if they had been a couple of policemen. The patching was done by a crew responsible to the President of the Borough of Manhattan.



DRIVES MUGGERS TO COVER

Experience proves that crime shuns well-lighted streets. A Chief of Police in Iowa, said, of a new lighting installation in his city: "It has cut the crime in that area 90%."

Listen to a Chief of Police, in Tennessee—"...helped reduce the rate of murders and major crimes of violence 70 to 90%..."

Or the Chief of Police in a Texas community. "We have practically eliminated assaults, purse snatching, and robbery on three streets by relighting them."

Communities everywhere are finding that modern street lighting—besides cutting crime—attracts business, lowers accident rates, stabilizes property values—that it saves more than it costs.

Your electrical utility is keenly interested in your community's prosperity. They have the know-how and the experience to help you modernize your street lighting quickly on an economically sound, planned basis. They can call on General Electric's services for planning and consultation. G-E street lighting equipment has the flexibility to meet the specific needs of your community. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

Let your electric utility street lighting engineer show you how comfortable seeing SAVES YOU FAR MORE THAN IT COSTS

GENERAL ELECTRIC

"The Most Effectively Lighted City of Its Size"

By LOUIS W. LOHREY, *Mayor Dayton, Ohio*

THE remark above is mine. In a five-square-mile downtown section, covering 10 of the city's main streets, 700 new General Electric mercury-vapor luminaires are being installed at 28-foot mounting heights on Union Metal shafts set on existing or new steel bases. According to H. S. Nonnemann, municipal representative of the Dayton Power and Light Co., which is responsible for the program, this downtown installation is the largest, most complete installation of its kind in any city of comparable size in this country. More than 8,000 new General Electric street lights will be in operation when the entire program is completed in June, 1952. Main Street is now in the same league with Chicago's State Street and Detroit's Washington Boulevard.

Whereas Main Street had formerly been illuminated by single-light, incandescent, 750-watt luminaires mounted upright at 15 feet, shedding 0.7 foot-candle, the boulevard is now lighted by 20,000-lumen mercury-vapor luminaires 28 feet high, giving a light intensity of 3.16 or more foot-candles.

The 750-watt light mounted on Union Metal's 807 upright standard as installed on Dayton streets after 1913.

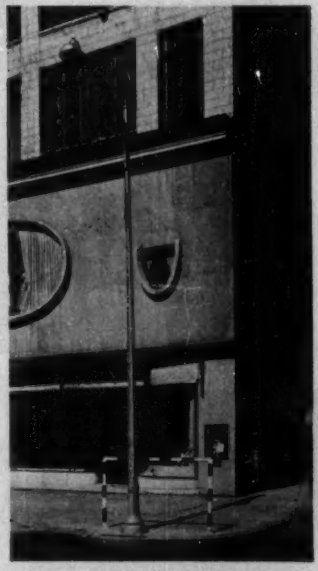
Another view of Main Street, Dayton, with the new Union Metal standards.

Of the 700 Union Metal poles, 425 are of new design, while 275 are change-overs. The new poles are 1-ply, 11-gauge cold-rolled steel with an ornamental base. The entire pole assembly is anchored to the concrete foundation by four 1-inch rods. The fluted poles have a maximum diameter of 7 inches and taper continuously to 3.71 inches, while the ornamental base is 20 inches in diameter at the ground line. The 45-degree upsweep bracket extends 6 feet over the roadway.

Change-over Poles Saved $25,000

The standards formerly used on Main Street (many are still in use throughout the city but will be re-vamped during this modernization program) were the Union Metal 807 upright type. The utility engineers salvaged the bases of these older standards, and Union Metal adapted a new shaft to them. These older bases employed only three ⅝-inch anchor rods, and the adaption necessitated using these bolts through a plate to hold the new shaft. Because the area of maximum stress is at the adaption point, engineers calculated that area for a 70-mile gale with 1-inch of ice, concluding that the ⅝-inch rods in good condition yielded a satisfactory safety margin. Where the rods did not meet the inspection requirement, a completely new pole was installed. These are cold rolled. The process is said to increase the strength of the formed tube by more than 50% of the original value of the metal.

Of the 8,000 street lights, more than half will replace outdated ones, and approximately 3,300 new lights will be installed on primary and secondary thoroughfares and in the residential districts. On 28 primary thoroughfares, 1,400 luminaires equipped with 6,000-



Note the slender symmetry of the new Union Metal shaft in the base of the old pole. In some cases the base is new, in others salvaged; but outwardly all of the standards are identical.

JOSLYN

BEFORE

Turns Night into Day at Miami Beach

GOOD STREET LIGHTING . . .

1. ***Reduces*** **Accidents and Crime After Dark**
2. ***Improves*** **Appearance and Property Value**
3. ***Promotes*** **Commercial Trade and Civic Pride**
4. ***Appeals*** **To Every Progressive, Far Sighted Citizen**

AFTER

Just Notice the difference in these two photographs taken recently on Alton Road in Miami Beach, Fla.

Joslyn Type 90 Luminaires with 6000 lumen incandescent lamps produced this transformation.

THE JOSLYN CO.
THE SOUTH EAST JOSLYN CO.
SOUTHERN JOSLYN CO.
JOSLYN SOUTHWEST CO.
JOSLYN PACIFIC CO.

JOSLYN MFG. AND SUPPLY CO.

Complete Pole Line Equipment

60 NORTH WACKER DRIVE, CHICAGO 6, ILL.

and 10,000-lumen lamps were installed on existing wooden distribution poles. The new lights replaced 750 old luminaires, and will provide about 100% more foot-candle intensity on the 40-feet-wide streets. Thirty 10,000-lumen sodium lights are being installed at several hazardous intersections.

On 98 secondary streets in Dayton, 1,500 luminaires will be installed replacing 832 older units. Existing poles were used and, as on the primary thoroughfares, foot-candle intensity will be doubled.

Although Dayton formulated plans for its present modernization in 1936, the city has always been progressive in

Mayor Louis Lohrey, right, receives from James Stuart, vice-president of the Dayton Power and Light Company, a model of one of the new standards.

street illumination. Its boulevard lighting dates to 1909. Until 1913 Dayton employed the five-light cluster of four 75-watt bulbs centered by one 100-watt bulb, mounted on a somewhat massive ornamental pole about 12 feet high. After 1913 Dayton decided to go to the 750-watt upright single light, being replaced now.

Prominent in Dayton power and light plans today is the application of G-E photoelectric street-lighting controls. One of the largest installations of the "electric eye" will turn the lights on and off automatically when the amount of daylight drops to a predetermined level.

Why Not Have Modern Street Lighting in Your City?

The companies listed below make the equipment for such lighting, and can help buyers make the most effective and economical use of the products

Cables

Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. In the field of low-cost series street-lighting cable for underground installation, direct burial or duct, Anaconda offers the following: Durasheath with Type AB insulation, a newly developed high-voltage synthetic-rubber compound, and neoprene jacket; polyethylene insulation and thermoplastic jacket; nonjacketed thermoplastic with either polyethylene or vinyl resin.

The Ansonia Electrical Co., P. O. Box 233, Ansonia, Conn. Single-conductor 5-kv series street-lighting cable in #6 AWG or #8 AWG solid copper furnished in two types: (1) a 6/64-inch primary insulation of polyethylene extruded over the conductor followed by a 3/64-inch polyvinyl chloride jacket; (2) a 10/64-inch wall of polyvinyl chloride applied over the conductor. Both designs are suitable, but we believe the first type superior due to the excellent electrical and moisture-resistant characteristics of the polyethylene. Two-conductor pole and bracket cable, rated at 600 volts between conductors, and 5,000 volts between conductor and ground, consists of a 3/64-inch wall of polyvinyl chloride insulation applied over each #8 AWG stranded copper laid parallel, followed by a 6/64-inch polyethylene jacket. This is also considered to be an improvement over the cable previously employed, provided heat baffles such as those used on the modern street-lighting fixtures are provided to isolate the cable from the hot portion of the lamp.

General Electric Co., Construction Materials Department, Bridgeport, Conn. Aerial or overhead, underground series loop, underground multiple circuits, overhead lines to luminaire or aerial type, IL transformer, and pole-base to luminaire street-lighting cable available.

Hazard Insulated Wire Works Div. of The Okonite Co., Wilkes-Barre, Pa. For modern, trouble-free street-lighting systems, Hazasheath cables are protected with a tough moisture-, oil-, and chemical-resisting sheath made with neoprene. Conductors are tin-coated for corrosion protection and ease in soldering, then insulated with Waterlite, a tough moisture- and heat-resistant insulation that has been in service on submarine and underground cables for more than 20 years. Firmly bonded to the Waterlite insulation is a final all-purpose sheath of Hazaprene that protects against mechanical damage and the deteriorating agents found underground.

United States Rubber Co., Rockefeller Center, New York 10, N. Y. U. S. pole and bracket cable, and neoprene-sheathed, for use in circuits where voltage between conductors is low but voltage between conductors and ground is relatively high, such as circuit from line to lamp in series street lighting. Flexible copper conductors are insulated with a 600-volt wall of Uskorona ozone-resisting compound. Two insulated conductors are laid parallel, and this assembly is insulated with a heavy wall of Uskorona compound to provide adequate insulation to ground. A protective sheath of tough weather-resisting neoprene compound is applied over all. U. S. low-voltage street-lighting cable, "zip-cord" type, for use in circuits of not over 600 volts to ground, such as from overhead line to lamp in parallel street lighting. Two stranded medium hard drawn copper conductors are laid parallel, each covered with a 4/64-inch wall of neoprene compound. The insulated conductor assembly is figure eight in cross-section and conductors are easily separated in making connections.

Controls

The Fisher-Pierce Company, Inc., 170 Pearl St., South Braintree 85, Mass. With Fisher-Pierce controls, incandescent or vapor lighting is turned on when natural north-sky illumination decreases to a pre-set level (1.0 foot-candle on standard units for incandescent lighting to give an average burning schedule of 4,150 hours). The lighting is turned off at a fixed value higher than the turn-on point. This fixed "differential" is 1.0 foot-candle on standard units for street lighting. A short time-delay protects against false turn-off caused by lightning or passing lights. The controls employ a stable two-stage amplifier and a phototube sensitive to north-sky illumination. Standard models are available for controlling either 500- or 3,000-watt lighting loads.

General Electric Co., Lighting Department 920 Western Avenue, W. Lynn 3, Mass. A complete line of street-lighting control equipment for both series and multiple control circuits. Series control including cutouts, lightning arresters, controllers, protectors, constant current transformers, insulating transformers and ballasts. Controllers are available both aerial and subway for both series and multiple control. Constant current transformers are available with various primary voltages and secondary currents, both pole and subway types, with and without power factor correction. Complete line of multiple control equipment to meet all circuit requirements from the secondary distribution circuit to the luminaire. Control includes switches, multiple relays, series multiple relays and photoelectric control.

Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill. Automatic time switches, photoelectric control, magnetic switches. Time dial and two trippers instantly removable for quick accurate setting or manual trip.

South Bend Current Controller Co., South Bend 15, Ind. R-C-O-C oil switches are recommended for switching the primary to transformers energizing outdoor-lighting systems. Automatic switching schedules are obtained by energizing the 120-volt control circuit to the switch-operating coils with a low-voltage time switch, with a light-sensitive relay, or with a relay cascaded to a system affording the desired schedule. Switches are also available with series operating coils for cascade control from a series circuit affording the required schedule. Available with auxiliary hand lever on switch tank for emergency manual operation.

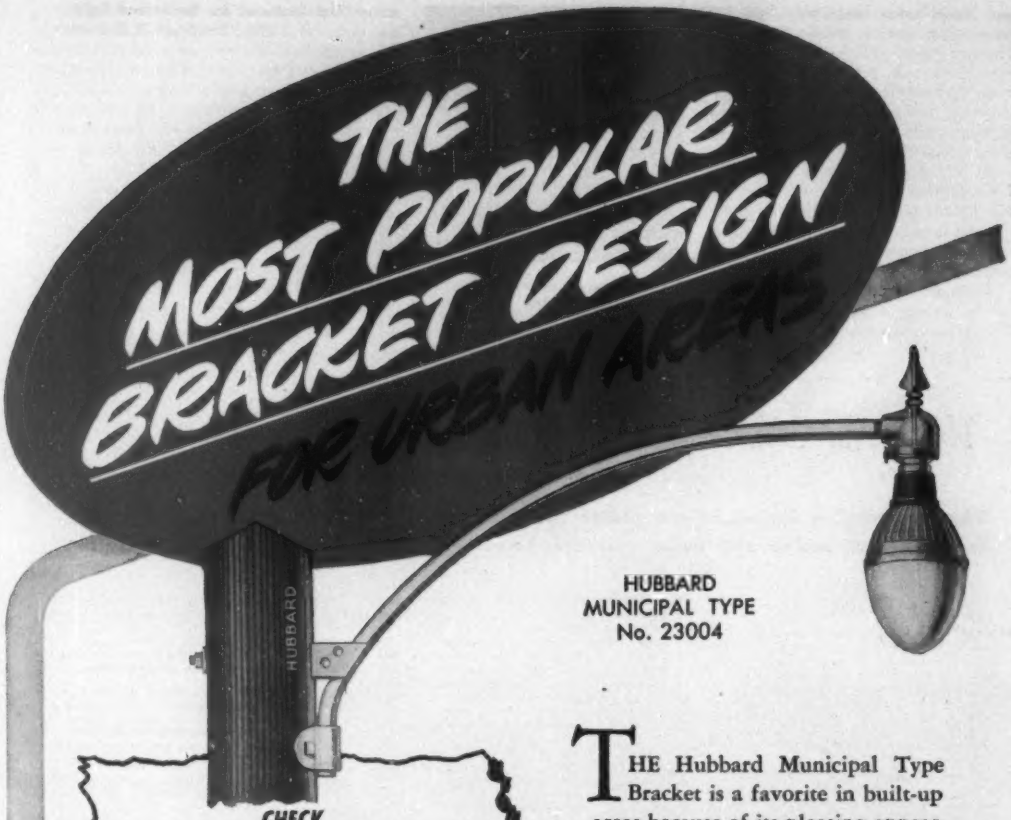
R-C-O-C protective relays for series lighting circuits are recommended for use with the remote-control primary oil switch. Under conditions of an open-circuit fault in the protected series circuit, the protective relay de-energizes the operating coils of the remote control primary oil switch to disconnect the constant current transformer from the primary supply.

R-C-O-C series multiple relays are designed with constant-current series operating coils insulated for connection in a series lighting circuit. The series coil is connected in a series lighting circuit, affording the schedule required for the multiple circuit energized from the relay low-voltage contacts. The multiple-load contacts are designed and tested for switching the rated normal current to a multiple incandescent lamp load.

R-C-O-C remote control relays with 120-volt 60-cycle operating coils and with load contacts rated for switching the supply to 120-volt a.c. light circuits are designated as multiple relays. Automatic switching schedules are obtained by energizing the control circuit to the relay operating coils with a low-voltage time switch, with a light-sensitive relay, or with a relay cascaded to a system affording whatever schedule may be desired.

(*Continued on page 151*)

THE MOST POPULAR BRACKET DESIGN FOR URBAN AREAS



HUBBARD
MUNICIPAL TYPE
No. 23004

CHECK
THESE ADVANTAGES

- ✓ All welded construction throughout
- ✓ Requires small pole mounting space
- ✓ Meets all current strength and design requirements
- ✓ "Keyhole," basic feature of pole attachment, permits installation by one man
- ✓ Simplicity of design means low cost
- ✓ Permanently aligned at factory
- ✓ "Free flowing" internal wiring—no sharp bends and no obstructions—wiring pushes through with a minimum of resistance

THE Hubbard Municipal Type Bracket is a favorite in built-up areas because of its pleasing appearance and adaptability. The bracket is internally wired and adaptable to either internally or externally wired systems. It may be installed close to the top of the pole for maximum elevation. It is easily installed by one man, comes in nominal lengths of 3, 4, 5, and 6 feet, with rises from 16 to 26 inches.

Write for Literature

HUBBARD AND COMPANY
ESTABLISHED 1843
PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA
"Hang the Load on Hubbard Hardware!"

Lamps

Champion Lamp Works, Division of Consolidated Electric Lamp Co., Lynn, Mass. Street-lighting lamps for series or multiple operation, either 2,000 hours or the group-replacement type of 3,000 hours. The regular service street-lighting lamp in the series type is the most popular. The group-replacement type is approximately 20% to 25% higher in cost, the life is 50% longer, the lumen output is the same, and the wattage consumption is 2% to 5% higher, and need be replaced only two-thirds as often. The term group replacement is applied to this lamp because they are designed to be replaced in a group at approximately 2,000 hours, thereby greatly reducing the cost of labor for relamping. When the regular 2,000-hour street series lamps are group-replaced, it is usually done after 1,500 hours of burning.

General Electric Co., Nela Park, Cleveland, Ohio. Complete line of filament, fluorescent, mercury and sodium lamps available for all outdoor lighting applications.

Luminaires

General Electric Co., Lighting Division, 920 Western Ave., West Lynn 3, Mass. A complete line of luminaires for street and highway lighting. Broadly, these luminaires can be classified as filament and mercury types. Filament luminaires for both multiple and series lighting circuits are offered in three categories. Luminaires for large-filament lamps using 15,000 lumens and upward are especially appropriate for downtown and white-way installation; luminaires using the popular 4,000-, 6,000-, and 10,000-lumen lamps for secondary business districts, traffic arteries, etc., and filament luminaires in the 2,500-lumen range largely applicable to residential streets. Mercury-lamp luminaires for both horizontal and vertical burning lamps are available for main traffic thoroughfares, some business districts, and busy interurban thoroughfares. Outdoor fluorescent luminaires are also available for overhead, low level and tunnel lighting application.

Line Material Co. (a McGraw Electric Co. Division), 700 W. Michigan St., Milwaukee 1, Wis. A complete line of incandescent and mercury-vapor luminaires for use on all sizes of streets and highways in protective-lighting areas. Categorically, these luminaires include open-type units, with stainless-steel or glass reflectors, or small, shielded-light-source units for residential lighting or where narrow streets and wide spacings prevail. These luminaires utilize 1,000 and 2,500 lumen lamps. For low-cost lighting of business districts and principal routes of traffic, L-M offers luminaires designed for use with incandescent lamps up to and including 15,000 lumens, and adaptable to accommodate either the 11,000-, 15,000-, or 20,000-lumen mercury-vapor lamps. Also available are luminaires designed specifically for all mercury-vapor lamps in both horizontal and vertical positions. L-M luminaires may be used on both multiple and series lighting circuits and provide all light distribution patterns as recommended by I.E.S.

The Joslyn Mfg. and Supply Co., 20 N. Wacker Dr., Chicago, Ill., offers a complete line of modern enclosed street-lighting luminaires designed to meet I.E.S. recommendations. Standard luminaires include aluminum reflectors, water-tight reflector-glassware seals (wedge-band or automatic latching) without gaskets, and refracting or diffuse glassware. Senior luminaires for high-intensity white-way applications; Junior for use with 1,000- or 2,500-lumen lamps in residential areas where the improved appearance of a compact, glassware-enclosed unit is desired. Also open luminaires, the most popular fitted with aluminum or 18-8 stainless steel radial bowl reflectors. A complete line of pipe brackets, mast arms, seamless steel tubular poles, and accessories.

Philadelphia Electrical and Mfg. Co., 1200-36 N. 31st St., Philadelphia 31, Pa. Included in the Pemco Line are many luminaires with internal Alzak reflectors and a hood tapped 1¼ inches or with a standard 1¼-inch slip fitter, and are available for either internal or external wiring. Clamp-type globe band permits easily relamping and seals the luminaire against dust. Open-type luminaires with hoods interchangeable with the Alzak luminaires. Most recent is the luminaire employing the simplicity and efficiency of the PAR-38 controlled-beam series street-lighting lamp. This lamp is equipped with bayonet blades and is easily replaced. It is never necessary to worry about the reflecting surface, as there is a new reflector each time the lamp is replaced. Mounting brackets in all standard sizes.

Stober Manufacturing Co., Broadview, Ill. Steberlites are cast-aluminum lampholders for PAR-38 and R-40 sealed-beam lamps for outdoor area and pin-point illumination; so compact that the light seems to emanate from an unseen source, brilliantly flooding the objects or area to be lighted. Since they are made of cast aluminum, there is no maintenance cost other than normal replacement of lamps. Steberlites may be mounted singly, in pairs, or in clusters of three to six lamps. Several clusters can be mounted on a single pole. Minimum size and weight serve to reduce wind resistance to a negligible factor.

Westinghouse Electric Corp., Lighting Division 1216 W. 58th St., Cleveland 1, Ohio. Manufacturers of a complete line of incandescent and mercury-vapor luminaires for street and highway lighting for either series or multiple circuits. Incandescent luminaires meet the EEI-NEMA Standards and are available in all ASA-IES light-distribution patterns. Three main endorsed luminaires for incandescent lamps are the AK-6, 1,000-2,500 lumen lamps for residential and suburban streets; the AK-10, 2,500-10,000-lumen lamps for residential, business, traffic thoroughfares and highways; and the AK-14, 4,000-15,000-lumens for highways, business streets, traffic arteries, and intersections. The OV-20 mercury-vapor luminaire uses either a 250- or 400-watt horizontal-burning mercury-vapor lamp, with an 11,000 or 20,000-lumen output, and features high efficiency and ease of maintenance.

Luminaires, Globes

Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa. Plexiglas acrylic plastic panels for fabricating Plexiglas II globes for street lights to 6,000 lumen and for breakage-resistant diffusers in fluorescent street lighting.

Standards, Brackets

American Concrete Corp., 4727 N. Lamon Ave., Chicago, Ill. Water-polished granite-finished lighting standards meeting I.E.S. and E.E.I. recommendations. In this program mounting heights were limited to 21½ feet, 26½ feet, and 31½ feet. Pole tops were redesigned for interchanging accessories such as single-pin pole tops and mercury pole-top adaptors. Brackets were redesigned to provide 45-degree cable bends and slip-fitter attachments. By means of a removable plug the end of the 2-inch bracket can be changed to a 1¼-inch slip fitter. More recently the standards have been adapted for fluorescent lighting.

The Electro Corp., 2900 Cormany Ave., Cincinnati, Ohio. Tubular steel lighting standards, to 30 feet; combination street-lighting and distribution standards; floodlighting standards to 110 feet long; wood-pole and steel-pole brackets to 15 feet overhang. Sales Manager A. L. Johnston cites a case where space on a jointly owned pole limited the street-lighting customer to 2 feet above the bracket arm or 2 feet below, for the support members. It was successfully accomplished for 8- or 12-foot mast arms of 1½-inch galvanized pipe, finished with one tie rod or with scroll.

General Electric Co., Lighting Department, 920 Western Avenue, W. Lynn 3, Mass. Aluminum and steel straight and upsweep brackets, mast arms and hanging devices for mounting any and all street lighting luminaires. Aluminum poles in all standard sizes and/or special applications. Distributors of American Concrete poles and Union Metal Steel Poles.

Hubbard & Co., Pittsburgh 1, Pa. Brackets designed for improved appearance on wood or metal poles, on business or residential streets and in parks. Higher mounting of luminaires without setting new poles and restricted pole space have been incorporated in the Hubbard one-piece upsweep brackets. They are in sizes of 3- to 8-foot extensions and most lengths use no more than 10 inches of pole space. The under bracket type provides an 8-foot arm. For greater lengths use Hubbard upsweep mast arms of tie-rod type and truss type. Furnished in galvanized steel and aluminum alloy.

Koppers Company, Inc. (Wood Preserving Division), Koppers Building, Pittsburgh 19, Pa., is a major supplier of wood poles, pressure-creosoted for long life—30 to 40 years; 23 wood-preserving plants strategically located throughout the country. Pole Buyers' Guide with specifications available.

Line Material Co. (a McGraw Electric Co. Division), 700 W. Michigan St., Milwaukee 1, Wis. Brackets and mast arms to meet every conceivable requirement. Bracket designs include single and double-curve upsweep, straight pipe, gooseneck, and sub-station for metal or wood pole mountings. Mast arms include complete pipe, trolly, and truss-weld types. In addition, L-M offers a variety of pole plates, scrolls, end fittings, miscellaneous fittings, suspension and mast-arm pulleys, and suspension fittings for luminaires. For complete specifications and catalogue information, request Bulletin SA1.

The Ryther-Purdy Lumber Co., 501 Tiffany St., New York 59, N. Y. Lighting standards of Western red cedar that resist decay, need no concrete foundation, require no maintenance. Their red-brown ads finish is ornamental. Single and twin-arm, height as desired.

The Union Metal Manufacturing Co., Canton 5, Ohio. Tapered, monotube street-lighting poles in steel or aluminum, fluted or plain round. These poles are designed to meet I.E.S. recommendations, with mounting heights up to 37 feet: graceful, upsweep brackets extending from 4 feet, 6 feet, and 8 feet for street lighting, and 10, 12, and 15 feet for highway lighting. Can be furnished with or without transformer base. Monotube poles are made by a special cold-rolling process whereby the grain structure of the metal is changed, providing added strength against traffic shock and impact. Also, poles for flood-lighting sports fields and recreational areas, public buildings, parking lots; bridge lighting; distribution and transmission poles; traffic-signal standards; pedestals for fire-alarm and police call boxes.

Where Gas Lights Still Glow

AT LEAST 37 cities still have some gas street lights in use, among them nine larger cities, the American Public Works Association reports. Included are Baltimore, Boston, Chicago, Cincinnati, Jersey City, Kansas City, Philadelphia, St. Louis, and Washington, D. C.

Baltimore has more than 13,500 gas street lights, with 1,500 to be replaced this year in a $200,000 conversion program. Among the smaller cities still having gas lights are: Bloomfield, N. J.; Brookline and Cambridge, Mass.; East Orange and Essex Falls, N. J.; Glendale, Ohio; Glenn Ridge, N. J.; Gloucester, Mass.; Kansas City, Kans.; Kenmore, N. Y.; Llewellyn Park, Montclair, and Morristown, N. J.; Newton, Mass.; Palmyra, Riverton, Florence, and Passaic, N. J.; Quincy, Mass.; South Orange, Verona, and Woodbury, N. J.; Worcester, Mass.; Bayshore, N. Y.; Newport, R. I.; and Brookfield, Lake Forest, and Riverside, Ill.

How **MONOTUBES** contribute to uniform see-ability

NOTICE how evenly abundant light is spread over the above business street. Here, regardless of season, hour or weather conditions, neither drivers nor pedestrians are ever impeded or endangered by spotty, light-to-dark illumination or hazardous shadows. It's a sure sign of sound planning and the proper selection of modern, well-designed equipment. The poles, highly important in the scheme of things, are high-strength, continuous-tapered steel Monotubes.

With Monotubes, the many variables involved in planning for highest street lighting efficiency can be met exactly—never any need to compromise! There are adequate, standard ranges in pole size, gauge, height, arms, brackets and accessories for *any* condition. There are round and fluted types perfectly suited for every kind of service from residential areas and arterial highways to the finest, most distinctive "White Ways".

If you're planning expansion or modernization, be sure to get *all* the facts on how you stand to gain by these and other Monotube advantages. Write The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL

Monotube Street Lighting Standards

Municipal and Civic Publications

Police Work and Civil Defense

UNITED STATES CIVIL DEFENSE POLICE SERVICES—*Federal Civil Defense Administration. Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. May* 1951. 46 *pp.* 20 *cents.*

This administrative guide suggests methods and techniques for assisting police officials responsible for organizing or directing police-civil-defense services. Mutual Aid, Communications, Resources, Training, Emergency Mobilization and Deployment, and Traffic Control are among the subjects discussed, with special emphasis on auxiliary police. The appendix describes standard jobs.

Civil-Defense Rescue Service

UNITED STATES CIVIL DEFENSE—THE RESCUE SERVICE—*Federal Civil Defense Administration. Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. May* 1951. 28 *pp.* 15 *cents.*

This administrative guide is published to assist state and local civil-defense organizations in organizing, selecting, equipping, and training rescue teams. Standard job descriptions are given in the appendix.

Voters' Handbook for a Small City

"THE FRIENDLY VILLAGE"—MAMARONECK, N. Y. —*Published by the League of Women Voters, Mamaroneck, N. Y.* 1951. 16 *pp.*

This little booklet gives an interesting historical sketch of the Village of Mamaroneck, and describes its village-manager form of government and its municipal services. General election information; organization charts of the village, and of the Towns of Mamaroneck and Rye in which it is located; school district information, and tax data comprise the main section of the pamphlet. The format could easily be adapted for use in other municipalities.

Lawyers, Please Serve!

PUBLIC SERVICE BY LAWYERS IN LOCAL GOVERNMENT—*By Murray Seasongood. Reprinted from* Syracuse Law Review, *Spring Issue* 1951. 17 *pp.*

This article is one of a series prepared by various competent persons for the Survey of the Legal Profession. When this Survey has been completed, probably about two years hence, the Council plans to issue a final comprehensive report containing its findings, conclusions, and recommendations.

Mr. Seasongood bemoans the lack of active interest of lawyers in their local governments—which he blames partly on fear of politics and partly on lack of proper civic education. He feels strongly that members of the legal profession must strive to bring about local reforms and improvements and that there must be increased popular confidence in legal process and in lawyers.

Plan for Capetown, South Africa

METROPOLIS OF TOMORROW, CITY OF CAPETOWN DEVELOPMENT PLAN, CENTRAL CITY AREA—*By S. S. Morris, City Engineer, Capetown, Union of South Africa. March* 1951. *Appendices. Illustrations.* 62 *pp.*

A bold and imaginative plan for developing and redeveloping much of Capetown's central city area is presented in this report. Resiting of the civic center is recommended, in addition to a major revamping of traffic circulation, including a monumental new ring road. The report may be of interest to planners in large American cities.

Planning of Shopping Centers

SHOPPING CENTERS, DESIGN AND OPERATION—*By Geoffrey Baker and Bruno Funaro. Reinhold Publishing Corporation,* 330 *W. 42nd St., New York* 18, *N. Y.* 1951. 278 *photos.* 196 *drawings.* 288 *pp.* $12.

This is an outstanding, tightly written volume on every aspect of shopping-center design and operation and should be in the library of every planning commission office. The book does more to make clear the impact of the automobile on urban land-use trends than any comparable book in the planning field. This is because 63 neighborhood, community, and regional shopping centers are minutely described and illustrated in the largest single section of the book. A great deal of information and analysis is included on parking for shopping centers.

Of special interest to planners is a section on market analysis of a new shopping center and complete analyses of two major shopping centers. There are also chapters on what makes a good shopping-center site, evolving the site plan, freight handling and service areas, and store buildings and amenities. A comprehensive table at the rear of the book lists stores by type and size in all of the shopping centers covered in the book.

Municipal officials and chamber of commerce officials concerned with the future of existing business centers would do well to study this volume, and adopt or adapt some of the techniques described for improvement of "Main Street" if it is to compete effectively with the new outlying, well-planned shopping areas.

Puerto Rico's Improvement Program

"OPERATION BOOTSTRAP" IN PUERTO RICO—*By Stuart Chase. National Planning Association,* 800 *21st St., NW., Washington* 6, *D. C. Sept.* 1951. 72 *pp.* $1.

This is a well-written, concise report on the remarkable progress achieved by Puerto Rico in its efforts to overcome under-industrialization, underemployment, and low standards of living. The major lessons of the report are:

1. Puerto Rico has demonstrated the effectiveness of a development program where businessmen and government leaders forget ideologies and cooperate on the basis of mutual respect.

2. What Puerto Rico has learned to do and not to do in her 10-year industrialization program can help in getting Point Four programs off to a better start in other low-income areas.

Some of the results of the program can be seen by an inspection of the outlays for public construction on the island during the year ended June 30, 1950. These outlays totaled $45,700,000, and covered water resources, housing, roads, schools, sewers, transportation, and hospitals and health.

Mr. Chase credits competent and imaginative public administration and management as probably the major factor in the success of the "bootstrap" operation.

Directory of Pennsylvania Municipal Authorities

PENNSYLVANIA MUNICIPAL AUTHORITIES' 1951 DIRECTORY—*Published by Pennsylvania Municipal Authorities Association,* 1717 *Main St., Northampton, Pa.* 1951. 56 *pp.* $2.

The directory includes all authorities organized under the Municipality Authorities Act of 1945 that were known to be active as of January 1, 1951. Under the name of each authority listed are its address, projects, and names and addresses of officers and board members. The associate members of the Association are listed at the end of the directory.

Industrial Dispersion Booklet

IS YOUR PLANT A TARGET?—*National Security Resources Board. For sale by the Superintendent of Documents, U. S. Govt. Printing Office, Washington, D. C.* 1951. 16 *pp.* 25 *cents.*

This colorful, illustrated booklet outlines principles of the new government policies, for industrial dispersion. The four major points are:

1. The program is designed for the new industry and expanding industry—not to move established industry.

2. No region of the country is to be built up at the expense of another.

3. Industrial dispersion can be carried out if such deployment is confined to each local marketing area.

4. State and local governments, in cooperation with private enterprise, are called upon to take the initiative in this defense objective, with the Federal Government providing encouragement and technical guidance.

The booklet recommends establishment of local site-selection committees as one way of getting the program started.

Proposals for Mobilization of American Communities

MEETINGS ON THE IMPACT OF MOBILIZATION ON AMERICAN COMMUNITIES, SUMMARY REPORT—*American Council for the Community,* 119 *E. 19th St., New York, N. Y. Mimeo.* 14 *pp.*

Two meetings, on June 13 and July 13, at which participants included federal, state, local, and other civic leaders, are reported in this document. Tentative proposals for the mobilization of American communities were divided into three categories: Local Community Responsibility, Cooperation of Federal Agencies, and the Role of Private Agencies. The trend of the conference was clearly toward a strong recommendation on the second point that there be a central office in Washington which would give agencies working with communities the necessary means for pulling their forces together. The conference also agreed that, just as there is need for a single federal body to work with communities on over-all defense needs and opportunities, there also should be a single private agency to assist and work with communities on specific problems.

Discrimination in New York State

NEW YORK STATE COMMISSION AGAINST DISCRIMINATION — 1950 REPORT OF PROGRESS — *Commission Offices,* 212 *State St., Albany* 6, *N. Y., or* 270 *Broadway, New York* 7, *N. Y.* 112 *pp.*

For five and one-half years, the New York State Commission Against Discrimination, in administering the New York State Law against discrimination, has investigated complaints alleging employment discrimination, and through an education program, has developed public acceptance of the evils of job discrimination. This review of the Commission's progress illustrates by case histories, charts, tables, and photographs the types of discrimination encountered (i.e., color, creed, national origin), by whom exercised (employers, labor unions, employment agencies), and in what type of occupation (mostly in clerical and operative jobs—very little in laborers' work).

Because of the educational work of the Commission, many Negroes are now being trained by large companies to do skilled work. A discussion of the media used in the educational work covers community councils, radio, films, literature, exhibits, and work with schools and colleges. Also included are: interpretation of the law, rulings on individual cases, and procedure followed.

84 TROLLEY COACHES

84 AVAILABLE for Daily Service

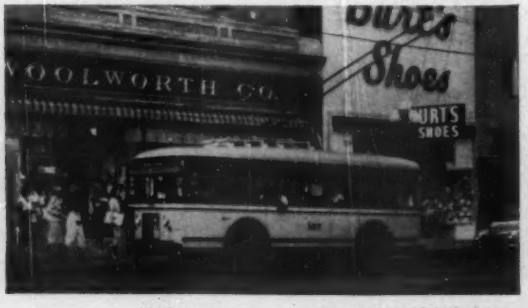
in Shreveport, La.

ELECTRIC TROLLEY COACHES • Now Serving 56 U. S. and Canadian Cities

● Look at the history of trolley coaches in Shreveport, La., and you see a practical story of trolley coach durability and long service life. Shreveport Railways Company started using trolley coaches in 1931. Of the original seven coaches, all but one are still available for service. No. 107, for example, pictured below, has traveled more than 612,000 revenue miles. Larger coaches, bought in 1936, have more than 900,000 miles to their credit. Today Shreveport has 84 coaches and every one of them is ready for daily service.

The people of Shreveport have learned a lot about trolley coaches in 20 years. Riders like the fast, comfortable service. Home owners have learned that property values rise when trolley coaches run near their homes. Management has learned that if it's possible to make a profit trolley coaches can do it. Maintenance men know you can keep trolley coaches running with a small stock of repair parts. They all know the trolley coach has proved itself as the best transit vehicle for Shreveport.

Congratulations to the Transit Industry for "100 Years of Transit Progress"



Ohio Brass

MANSFIELD OHIO, U. S. A.

LINE MATERIAL AND CAR EQUIPMENT FOR TROLLEY COACHES AND STREETCARS

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

4162-T

Planning and Housing Reports

BOMBAY, INDIA—An Outline of the Master Plan for Greater Bombay. A report prepared by N. V. Modak, Special Engineer for the Bombay Municipality, and Albert Mayer, Architect and Town Planning Consultant, of New York City. Bombay Municipal Corporation, The Mercantile Bank Bldg., Mahatma Gandhi Road, Bombay No. 1, India. Charts. Maps. 73 pp.

CHICAGO, ILL.—Redevelopment Project No. 2. A report by the Chicago Land Clearance Commission to the Mayor and City Council of the City of Chicago and to the Illinois State Housing Board on a proposal to reclaim a vacant and tax-delinquent subdivision. Mimeo. Illus. June 1951. 28pp.

COUNCIL BLUFFS, IOWA—A City Plan for Council Bluffs, Iowa. Hare and Hare, City Planners, Kansas City, Mo. 1950. Illus. Tables. Maps. 123 pp.

DETROIT, MICH.—Detroit Master Plan. City Plan Commission, 1214 Griswold St., Detroit 26, Mich. July 1951. Illus. 96 pp. $5.

NEW YORK—Within This Frame—Life and Spirit Grow. An illustrated account of the work planned and accomplished by the State of New York Division of Housing. State of New York, Division of Housing, 270 Broadway, New York 7, N. Y. 1951. 90 pp.

NEW YORK—New York City—A Study of its Population Changes. City Planning Commission. July 1, 1951. Graphs. Maps. 32 pp.

OSHKOSH, WIS.—Oshkosh, Wisconsin—An Economic Base Study. By John W. Alexander, Asst. Professor in the Department of Geography at the University of Wisconsin. Bureau of Business Research and Service, 404 Sterling Hall, University of Wisconsin, Madison 6, Wis. Illus. 72 pp.

PROVIDENCE, R. I.—Annual Report of the City Plan Commission for the Fiscal Year Ended September 30, 1950. City Plan Commission, Suite 103, City Hall, Providence 3, R. I. Mimeo. 16 pp.

TULSA COUNTY, OKLA.—Questions and Answers About Zoning for Tulsa County. Tulsa County Planning Commission, 1212 So. Frisco, Tulsa, Okla. Planning Bulletin No. 6. August 1951. Mimeo. 6 pp.

WASHINGTON, D. C.—Questions and Answers About Redevelopment in Southwest Washington. Published by the District of Columbia Redevelopment Land Agency, 499 Pennsylvania Ave. NW., Washington, D. C. May 23, 1951. Mimeo. Unpaged.

UNITED STATES—Building Type Reference Guide No. 7—Airports (Part III). Published in the *Bulletin of The American Institute of Architects*, The Octagon, 1741 New York Ave. NW., Washington 6, D. C. July 1951.

——How To Test Financial Soundness of Rental Housing Properties. A Federal Housing Administration Rental Housing Publication. FHA Form No. 2404. 1951. 22 pp.

——Questions and Answers on CMP as it Affects Home Building. Obtainable from District Offices of the FHA.

——Administration of Natural Resources. A selected list of references relating to the TVA program. Available from the Director of Information, Tennessee Valley Authority, Knoxville, Tenn. June 1, 1951. Mimeo. 16 pp.

——Topical Outline for a Community Program for Industrial Development. Prepared by Arthur M. Field, Chief Engineer, Charleston Development Board, Charleston, S. C. 1951. Mimeo. Charts. Maps. 27 pp.

——Fourth Annual Report of the Housing and Home Finance Agency. For Sale by the U. S. Govt. Printing Office, Washington 25, D. C. 1951. 467 pp. $1.25.

Other Reports Received

BIG STONE GAP, VA.—Sixth Quarterly Report of the Town Council. 1951.

CINCINNATI, OHIO—The Annual Report of the City Manager for the Calendar Year 1950.

CONNECTICUT—A Survey of Assessment Administration in Connecticut Towns and Cities. By Alden C. McCray, Graduate Fellow, Institute of Public Service, University of Connecticut, Storrs, Conn. Informational Bulletin No. 6. July 1951. Mimeo. Charts. 17 pp.

DUBUQUE, IOWA—The Fifty-first Annual Report of the Water Department of the City of Dubuque, Iowa, April 1, 1950 to March 31, 1951. Illus. Tables. 59 pp.

EASTON, PA.—Report of Planning Activity in 1950. Prepared by Morris Knowles, Inc., Consultants, Pittsburgh 22, Pa. Charts. 32 pp.

ESSEX COUNTY, MASS.—Annual Report of the County Engineer for the Year Ending December 31, 1950. Tables. 23 pp.

GREENWICH, CONN.—Summary of the Annual Report of the Town of Greenwich, Connecicut. for the fiscal Year January 1 to December 31, 1950. Illus. Tables. 93 pp.

KANSAS—Kansas Government—A Short Course. Published by The League of Kansas Municipalities, Topeka, Kans. Pub. No. 132-51. Fourth Edition. July 1951. 136 pp. 75 cents.

MICHIGAN — Proceedings of the Fifth Annual Short Course for Municipal Assessing Officers. Obtainable from The University Press, 311 Maynard Street, Ann Arbor, Mich. Papers in Public Administration No. 7. 1951. 46 pp. $1.50.

NEW HAMPSHIRE—Civil Defense. Summary of the Proceedings of the Eighth Institute of Public Affairs of the University of New Hampshire. Bureau of Government Research, University of New Hampshire, Durham, N. H. 1951. 38 pp.

PHOENIX, ARIZ.—How Your Health Department Serves You and Your Community. Health Department, Phoenix, Ariz. Illus. Unpaged.

SAN FRANCISCO, CALIF.—Report of the Senate Fact-Finding Committee on San Francisco Bay Ports, Part II. Published by the Senate of the State of California, Sacramento, Calif. 1951. 194 pp.

VIRGINIA—Fire Hydrant Charges in Virginia Cities and Towns. League of Virginia Municipalities, 905 Travelers Bldg., Richmond 19, Va. Report No. 342. August 1951. Mimeo. 4 pp.

WASHINGTON — Acquisition, Conveyance, Leasing, and Condemnation of Real Property of Cities and Towns. Published by the Association of Washington Cities in cooperation with the Bureau of Governmental Research and Services, University of Washington, Seattle 5, Wash. Information Bulletin No. 135. July 14, 1951. Mimeo. 29 pp.

——Regulation of Peddlers. Published by Bureau of Governmental Research and Services, University of Washington, Seattle 5, Wash., in cooperation with Association of Washington Cities. Report No. 116. July 1951. 81 pp. $1.50.

——The Regional Library and the State Aid Program. Proceedings of the Public Library Administration Section 15th Annual Institute of Government, 1950. Distributed by the University of Washington Press, Seattle 5, Wash. May 1951. 31 pp. $1.

UNITED STATES—Disaster Blueprint for the Industrial Physician. Prepared by the Council on Industrial Health, American Medical Assn., 535 N. Dearborn St., Chicago 10, Ill. 1951. 11 pp.

——Civil Defense—Now! A selected list of books, documents, films, and filmstrips available for loan or for consultation at the Detroit Public Library, Detroit, Mich. 1951.

——One Story Hospital Construction. Material prepared by Julian Smariga, Structural Engineer, Public Health Service, Division of Hospital Facilities, Washington, D. C. April 1951. Mimeo. Illus. 8 pp.

——Planning and Organizing for Radiological Defense in Civil Defense. Available from the Council on National Emergency Medical Service of the American Medical Assn., 535 N. Dearborn St., Chicago 10, Ill. Mimeo. 105 pp.

——Policy Declarations on Natural Resources. Chamber of Commerce of the United States, Washington 6, D. C. 1951. 35 pp.

——Preliminary Estimates of Project Costs. Estimated average cost of hospitals designed by the Federal Security Agency, Public Health Service, Division of Hospital Facilities. March 1951. Mimeo. 10 pp.

——Principles of Civil Defense Operations. Federal Civil Defense Publication AG-8-1. For sale by the U. S. Govt. Printing Office, Washington 25, D. C. July 1951. 45 pp. 20 cents.

——State Tax Collection in 1951. Department of Commerce Bureau of the Census, Washington 25, D. C. August 1951. 10 pp.

——Several Aspects of Grease Separation in Grease Traps as Influenced by Various Detergents. Part I, Behavior of Synthetic Detergent-Grease Emulsions in Rotation Tanks. Research Division, College of Engineering, New York University, New York, N. Y. March 1, 1951. Mimeo. 18 pp.

——The New Hospital: Methods and Outlines for a Symposium on Hospital Operation. Edited by Edward L. Tolson, Jr., M.H.A., Hospital Consultant, Division of Medical and Hospital Resources, Federal Security Agency, Public Health Service, Washington, D. C. Reprinted, with editions, from *The Modern Hospital*, July 1951.

——The Warden Service. Federal Civil Defense Publication AG-7-1. For sale by the Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. August 1951. 44 pp. 20 cents.

——Training Plan Courses in "Medical Aspects of Atomic Warfare," "Medical Aspects of Radiological Defense," "Radiological Defense (Monitors)." Available from Council on National Emergency Medical Service of the American Medical Assn., 535 N. Dearborn St., Chicago 10, Ill.

——Water Supplies for Wartime Fire Fighting. Federal Civil Defense Publication Technical Manual 9-1. For sale by the Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. 14 pp. 10 cents.

Princeton Sponsors Urban Planning Forum

AN URBAN PLANNING FORUM is being sponsored by the Bureau of Urban Research, Princeton University, during the latter part of October. The five lectures, which should interest many public officials, are being offered without charge, and will be held at 8 p.m. in the Auditorium, Frick Chemical Laboratory, Washington Road and William Street, Princeton, N. J.

The schedule of speakers and subjects is as follows:

October 22—The Planning Process and Public Participation by Hugh R. Pomeroy, Director, Westchester County Department of Planning

October 23—Land Use and Zoning by Norman Williams, Jr., Director, Division of Planning, New York City Planning Commission

October 25—Housing and Urban Redevelopment by Charles K. Agle, Architect and Planning Consultant

October 29—Transportation by C. McKim Norton, Vice-President, Regional Plan Association, Inc., New York City

October 30—Taxation and Fiscal Programming by Walter H. Blucher, Executive Director, American Society of Planning Officials.

Lessons from Disaster

(*Continued from page* 85)

Therefore, I should advise formalizing the channels of communication as rapidly as possible when an emergency situation develops. We did this very early in our emergency, with a set-up to mimeograph all news releases, administrative orders, and emergency flood orders. Routing slips were used to insure delivery of all releases and emergency orders to all levels of the emergency operation. At the same time, complete binders of news releases and emergency orders were established at the information center and for each department head. Messengers were used to deliver news bulletins and emergency orders to all departments and to Police Headquarters and Red Cross Headquarters, which were in buildings other than the City Hall. The Red Cross and the Boy Scouts were most cooperative in furnishing such messengers.

Although the installation of FM radios in all field vehicles was not complete when the flood occurred, we did make extensive use of existing installations in Fire and Police Department vehicles as well as the mobile telephones with which several vehicles were equipped. Since the flood we have expanded somewhat our plans for installations of radios in field vehicles on the basis of excellent experience with what we had. Such forms of communications will be particularly important in any disaster which might do extensive damage to the telephone system.

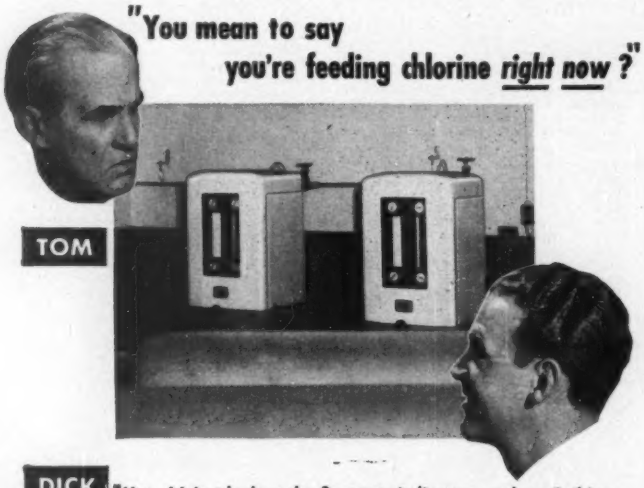
Of a certainty, any real emergency is going to call for some kind of a procedure of passes or permits to allow people to enter certain areas. It is difficult to lay down any general principles to be followed in this matter, because of differences from place to place of local conditions and personnel as well as of the particular type of emergency. However, on the basis of our experience, I should say that it is entirely possible—and, in fact, desirable—that some pass or permit systems be planned in advance to meet different emergency situations. These systems should be flexible enough to be adaptable to any general situation and should be administered by persons familiar with the area or activity which you are restricting to passes and permits. For example, if you were going to regulate motor-vehicle traffic by pass or permit, I should advise very strongly calling in your traffic-engineering and police personnel to assist in planning the operation and turning over to them the details of administering such a process.

Conservation Orders

Conservation orders become a "must" in a situation such as was faced in Kansas City and would be of even more urgent necessity in the event of a bombing, which would have a much greater destructive effect on underground utility facilities. Prime areas for conservation orders are those of water; restrictions on traffic; fire prevention; and, in the case of a bombing, electrical and gas consumption. Since our water supply was cut 65% through the temporary loss of one of our pumping stations, we issued some water-conservation orders, in which we particularly stressed extreme conservation of water for non-essential uses. However, we never did feel that our orders were detailed enough to accomplish the desired ends. In this connection, we found it advisable to use permits in relaxing certain water uses and that, generally, merchants and individuals were glad to cooperate in this method. This was especially true of such heavy water users as air-conditioners and laundries.

In conclusion, I think it fair to say that every city owes it to its citizens to do some planning of the type outlined above in anticipation of disaster in one form or another. All too fre-

(*Continued on page* 159)

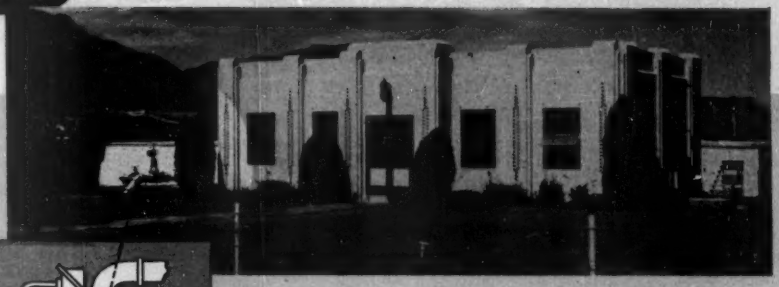

"You mean to say you're feeding chlorine right now?"
TOM
DICK "Yes, sir! Just look at the flow rate indicators on these Builders Chlorinizers. When they show a chlorine flow, you can be sure chlorine actually is being fed. Incidentally, why do you ask?"
TOM "Well, I always thought chlorine odors and corrosive fumes were a necessary evil in any chlorinator room. How come I don't smell chlorine in here?"
DICK "We've discovered that Builders Chlorinizers never give off chlorine odors in operation. You see, fresh water is continuously supplied to the tray, drawn into the injector with the chlorine gas, and delivered to the point of application. You can't get tray-produced odors with Chlorinizers in your plant!"
FOR ANY CAPACITY
FOR ANY CHLORINATION SERVICE
If you're like Doubting Tom, now's the time to find out more about Builders Visible Flow Chlorinizers. Available in three volumetric models . . . for any chlorination service:
Up to 400 lbs./day Model DVSX Bulletin 840-F2A
Up to 2000 lbs./day Model CVS Bulletin 840-F1
Up to 6000 lbs./day Model HCVS Bulletin 840-G27
For Bulletins, address Builders-Providence, Inc. (Division of Builders Iron Foundry), 45E Harris Ave., Providence 1, Rhode Island.
BUILDERS PROVIDENCE
Instruments
BIF INDUSTRIES
BUILDERS

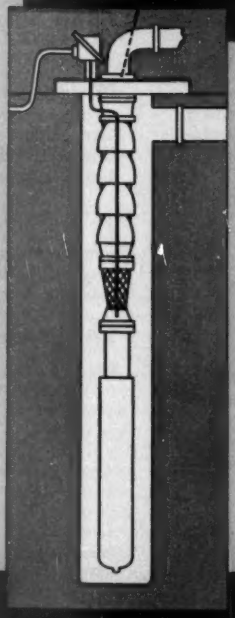
another

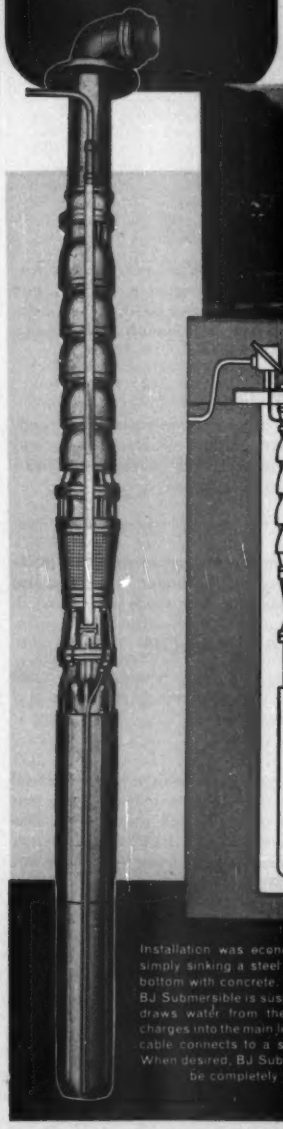
BJ

submersible pump
case history

El Paso's Invisible Pumping Station saves money, saves maintenance, and safeguards water supply in times of emergency







Installation was economically achieved by simply sinking a steel casing sealed at the bottom with concrete. The 200 hp, 2000 gpm BJ Submersible is suspended in the casing, draws water from the reservoir, and discharges into the main line. The marine power cable connects to a simple starting panel. When desired, BJ Submersible Stations can be completely underground.

The old and the new in pumping stations...

FIFTEEN YEARS AGO, the City of El Paso built a pumping station housed in the building above. This station uses 100 sq. ft. of space per mgd of pumping capacity, requires operating supervision and building maintenance. Now, El Paso has built another pumping station using a Byron Jackson Submersible Pump. This new, invisible booster station *uses only 12 sq. ft. of space per mgd, needs no pump house, and requires no operating supervision or building maintenance!*

According to E. Nevins, Production Superintendent of El Paso's Water Department..."today we feel that there is no real justification for a pump house. We have had such success with these submersible pump and motor combinations that all our future stations and wells will probably have them. Certainly, water-works officials will feel a lot better if their important pumping stations are underground, away from possible air attack and in a place difficult to sabotage."

BJ Submersible Pumps can help your city save unnecessary real estate investment, construction costs and maintenance expense, and safeguard your vital water supplies in time of flood, fire, war or other emergency. Pumping capacities to 20,000 gpm are possible and heads to 1500 ft. For additional data send coupon below or call your local Byron Jackson office.

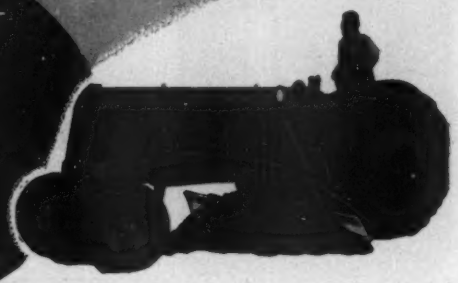
Byron Jackson Co. Dept. No. 50
P.O. Box 2017 Terminal Annex
Los Angeles 54, Calif.
Send me full data on the BJ Submersible

NAME _____

POSITION _____ DEPT. _____

CITY _____ STATE _____

Some of the Jobs HUBER MAINTAINERS Are Doing



NATIONAL GOVERNMENTS

Grading and maintenance work on highways and secondary roads in national parks, reservations, national public lands.

STATES

Highway grading and maintenance service of many kinds including berm grading, mowing, ditch cleaning, etc.

COUNTIES

Highway and secondary road grading and maintenance work. Counties owning attachments keep HUBERS busy every month of the year.

MUNICIPALITIES

Street and alley grading and maintenance; every type of maintainer attachment is in municipal service.

TOWNSHIPS

Townships charged with road maintenance are among favorite users of Huber Maintainers for grader and maintenance work.

PUBLIC GROUNDS

Parks, playgrounds, conservation areas, publicly-owned beach areas need and use HUBERS for grader and maintenance service.

OIL FIELDS

HUBERS are at work in the oil fields, grading and maintaining off-the-highway roads and building dams around oil wells and storage tanks.

CEMETERIES

Cemeteries keep HUBERS busy every month, grading and maintaining drives, mowing, developing new grounds, removing snow, patching pavements, etc.

AIRPORTS

HUBERS are tailor-made for airport service, grading unpaved areas, patching paved areas, mowing, removing snow, towing planes, etc.

LOGGING

Grading and maintaining logging camp roads, mowing, bulldozer service.

INDUSTRIES

Many industrial users include factories with sizeable grounds and miles of roadways; lift loader widely used for cleanup work around factory sites.

MINES

Grading and maintenance of roadways; broom widely used around strip mines to sweep coal veins before removal.

ESTATES & RANCHES

Grading and maintenance of roadways; lift loader for cleanup; mower widely used.

RACE TRACKS

Grading and maintenance of track and of surrounding roadways and grounds.

CONTRACTORS

Contractors, large and small, in all kinds of contract work, are enthusiastic HUBER users. They like versatility of HUBERS, ability to move rapidly from one job to another.

HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.

Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

HUBER

(*Continued from page* 156)

quently some sort of major disaster is visited upon one section or another of this country. Your city may be next. And remember this—be your disaster natural or man-made (such as a bombing), it will be the local government which will have to bear the brunt of initial shock and make the first moves toward recovery.

Two reports have been prepared by Kansas City departments covering vital segments of their flood operation, which may be of value to officials of other municipalities in disaster planning.

The first report, "Kansas City Flood, 1951, Public Information Program, Flood Emergency Headquarters," summarizes the public-information program and its organization and contains copies of all news releases issued by the city during the flood emergency. The second report, "Kansas City Flood, 1951, Flood Emergency Organization and Department Activities," contains the story of each department during the flood, organizational and functional charts, and a summary of emergency services and responsibilities.

The reports are priced at 75 cents each and may be obtained from the Research and Budget Department of the City of Kansas City, Mo.

Huge Expansion Program

(*Continued from page* 97)

sand to provide for the proposed final elevation over the entire area. It is estimated that between five and six months of dredging will be required to make this tract, containing 497 acres, available for urban development. But, within 90 days after dredging has started, a small but adequate area will be available for the construction of a housing project.

The 497-acre area contains proposed residential sections for occupancy by both the white and Negro races, at a density of 12 dwelling units per acre, to accommodate a total of 1,855 families.

In addition to housing areas—both multiple-family units and single homes—the reclaimed area will have new schools and a system of parks and playgrounds that have been planned according to present-day standards so that people living in the new area will have the best recreational facilities possible.

Modern shopping areas with adequate off-street parking facilities have been drawn into the picture as have been lakeside locations for hotels and apartment houses to augment this community's present inadequate tourist accommodations and facilities.

Junior and senior high schools, grade schools, and even a junior college round out the plan for educational facilities.

The plan also includes a blueprint for public services such as police and fire protection, garbage collection, mass bus transportation, water systems, sewage lines and disposal plants, street lighting and power service, and all the other details for modern development.

The city government has informed the water company of its desire to begin at once implementation of the over-all expansion program, so that the water company can seek necessary private-capital financing for the land development. The city has also promised to time the annexation of the several unincorporated tracts in the expansion area so as to defer liability for municipal taxes until the tracts are ready for use. It is exploring the feasibility of a federal low-rental housing project upon one of the areas in the proposed plan, and seeking federal participation for construction of the expressway and interchanges shown in the report. It has also retained the Bartholomew firm to prepare an over-all city plan to insure that the expansion area will be properly coordinated with the city's long-range program.

YOU, TOO, CAN GET RESULTS LIKE THESE with BATTERY AD-X2*

Here's what three West Coast users**, each with two to four years experience with Battery AD-X2, say . . .

BUS LINE — "Battery AD-X2 Re-processed Batteries are about 15% lower in original cost, and have at least twice the life expectancy. We also treat all new batteries with Battery AD-X2 to prevent sulfation."

POLICE CAR FLEET — "Life expectancy extended from 12 to 18 months beyond normal even though batteries were not new at time of treatment."

EQUIPMENT DEALER — "Your method of handling our battery problems has saved up to 50% on our battery costs over past 3½ years . . . also reduced downtime on rented equipment."

Why delay? Get Battery AD-X2 TODAY. Treatment for Group 1 and 2 battery, $3.00. Or use our Re-processed Batteries. Money-back guarantee. Write or phone NOW for price list, fleet discounts and address of nearest distributor.

**Names and addresses on request.

Still some territories, State and local, open to qualified operators.

* Trademark

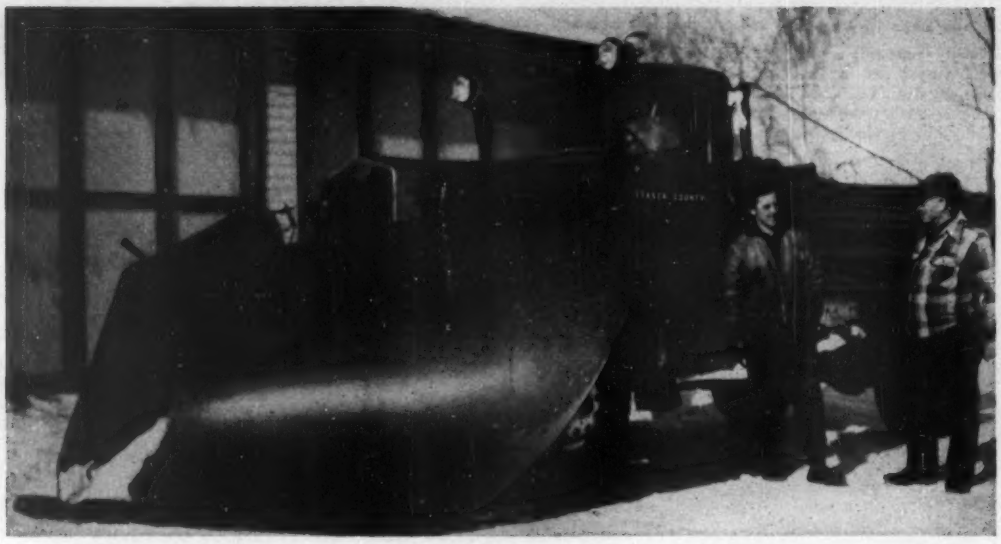
Extends the life expectancy of mechanically sound lead-acid batteries.
Initial treatment with "Battery AD-X2" good for life of battery.
Apply only to Mechanically Sound Batteries.
Satisfaction GUARANTEED provided instructions on use of "Battery AD-X2" are followed.

None genuine without this picture and signature on package

PIONEERS, INC.

2411 GROVE ST., OAKLAND 12, CALIF.

In use continuously since 1947, keeping lead acid batteries stronger longer. 12



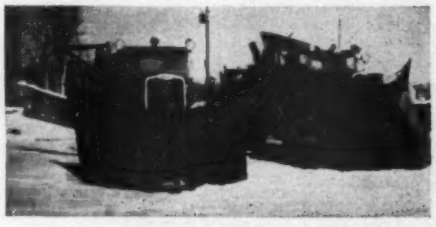
BILL SMITH, SR., AND BILL SMITH, JR.
Balsam Township, Minnesota

TWO Generations Drive Same Oshkosh Truck!

• 18 years ago, when Bill Smith operated this Oshkosh truck for Itasca County, Minnesota, young Bill was in kindergarten. Today—Bill, Jr., holds Dad's old job . . . drives same dependable Oshkosh 4-wheel drive truck.

Still going strong—after 18 years' continuous service on Itasca County roads! An "old-timer" compared to modern Oshkosh equipment, its rugged engineering keeps it rolling year after year.

Oshkosh Trucks, with sure-footed traction in ALL wheels, are designed for gruelling snow removal work . . . on-and-off highway hauling . . . construction jobs . . . with minimum upkeep expense. Ask the Bill Smith family . . . or any Oshkosh user



Model Y2D-704, 1933 Oshkosh Truck shown with other Oshkosh Trucks operated by Itasca County, Minnesota.

SERVICE STATIONS LOCATED AT CONVENIENT POINTS THROUGHOUT THE UNITED STATES AND CANADA.

Write for new "IB" Folder which shows why, feature for feature, no truck equals an OSHKOSH.

OSHKOSH

4 and 6 WHEEL DRIVE TRUCKS

OSHKOSH MOTOR TRUCK INC.
OSHKOSH WISCONSIN

Municipal Purchasing News

Information for officials interested in equipment and services for the construction, operation, and maintenance of municipal utilities

Seal Split Coupling Clamp Repairs Broken Water Mains

The Skinner seal split coupling clamp repairs broken gas and water mains in 5 to 15 minutes. Manufactured by the M. B. Skinner Co., South Bend 21, Ind., the clamp consists of two malleable iron intermeshing compression rings, a monal-metal seal band, heavy gasket, break-covering brass band, and electroplated, high-tensile steel bolts. It is tested to 800 pounds of line pressure.

New Items Introduced By Sparling Meter

Four aids to the measurement of liquid flows appeared for the first time in the Sparling Meter Co.'s catalog-bulletin 311, recently released. These include: a saddle-mounted meter for reinforced concrete pipe; a conveniently designed flow-rate controller; a level and open-flow indicator, and a differential indicator-totalizer.

The saddle for the reinforced concrete pipe can be cased integrally with the pipe section, and the saddle welded to the reinforcement. The top of the saddle is machined to take the head plate so that the propeller will be centered in the line. Straightening vanes often are used in the larger pipe sizes. The saddles are available for pipe sizes from 6 inches and larger.

The Flow-Rate Control valve consists of a Sparling Metrovalve and uses a Sparling main-line meter and a Hydrovalve controlled by a flow-rate selector mounted on the meter head or in the control room. The desired rate of flow is set on the selector and the Hydrovalve is automatically adjusted to this setting. A head control provides for over-riding manual operation.

The level and open-flow indicators furnish instant information on height in inches or flow rate or both. The indicator can be actuated by a float or pressure transmitter.

The differential indicator - totalizer operates by electric impulses from the meterhead on the same principle as the Striptograph but without recording. It can be mounted on a wall, table, or panel. It indicates flows over a range of 1 to 33, and also duplicates the totalizer buildup at the meter.

The entire bulletin features ease on installation, consistently close accuracy, and negligible pressure drop through the meters. Compound meters handle flow ranges as wide as 1 to 125. Bulletin 311 can be obtained by writing directly to the company at Box 3277, Terminal Annex, Los Angeles 54, Calif.

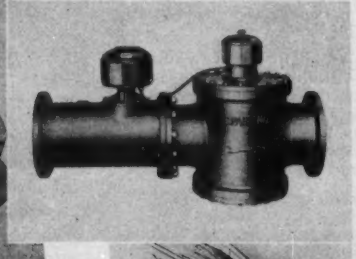
Civilian Defense Badges Available in Two Sizes

Shown here is one of the many Blackinton badges that have been adapted to Civilian Defense. Badges are available in two sizes with either plain or colorful hard enamel seals. According to the manufacturer, V. H. Blackinton & Co., Inc., Attleboro Falls, Mass., Civil Defense badges are becoming increasingly popular in cities and towns throughout the country.

The company also produces a complete line of fire and police badges.

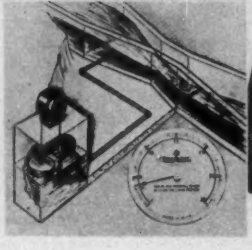
Descriptive literature on the equipment may be obtained by writing to the manufacturer.

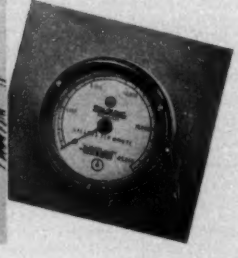
This saddle mounting (shown above) is designed for reinforced concrete pipe.



This Sparling Metrovalve (pictured left) makes selection of rate of flow or an easy, complete shut-off.

This easy-to-read dial (below) indicates and totalizes flows.





The open-flow indicator (at the right) can be fitted to a Parshall flume in this way.

For Traffic Control-

Adlake Relays are always on the go!

(Above) ADLAKE Relays perform a vital function in traffic controllers —give dependable, inexpensive, maintenance-free operation.

(At right) This traffic controller utilizes six ADLAKE "Mighty Midget" Relays, chosen for their compactness, sensitivity and heavy load characteristics.

DEPENDABILITY is the watchword in traffic control —and traffic engineers in many of our leading metropolitan areas know that ADLAKE Mercury Relays can be depended on, year in and year out, in every type of weather.

ADLAKE Relays are preferred in all types of traffic control—bridge and railroad crossings, fire lanes, cascade and switch lighting—because of their constant timing characteristics, compactness and ability to carry heavy loads. They are hermetically sealed against dirt and weather, and require no maintenance whatever.

MODERNIZATION of old traffic control equipment is easy and economical with ADLAKE Relays, and ADLAKE engineers are always ready to work with you on your particular problems. For full information, just drop a card to The Adams & Westlake Company, 1125 N. Michigan, Elkhart, Indiana. No obligation, of course.

ADLAKE Mercury Relays *Bring These Advantages to Every Installation!*

HERMETICALLY SEALED—dust, dirt, moisture, oxidation and temperature changes can't interfere with operation.

SILENT AND CHATTERLESS • REQUIRE NO MAINTENANCE

ABSOLUTELY SAFE

Adlake TRADE MARK — **THE Adams & Westlake COMPANY**

Established 1857 • ELKHART, INDIANA • New York • Chicago
Manufacturers of Hermetically Sealed Relays

Klopp Engineering Moves

Klopp Engineering, Inc., manufacturer of coin counters and coin handling equipment since 1924, has moved from 5736 Twelfth St., Detroit, to its new plant at 35551 Schoolcraft, Livonia, Mich. Klopp's new mailing address will be P. O. Box 134, Plymouth, Mich.

Pipe Line Repair Products

Pipe line repair products of the Stauffer Mfg. Co., 2453 Merced Ave., El Monte, Calif., include clamps for high pressure lines made with stainless steel bands, copper bands, or galvanized iron bands, broken pipe clamps for repair of broken cast iron or asbestos-cement pipe and pipeline repair plugs.

The Stauffer Superior pipe repair clamp permanently repairs leaks, blow-outs, and short splits. It is used by oil, gas, and water utilities under the most severe conditions. The manufacturer reports that the clamp has ability to withstand abnormally high pressures. It is constructed of stainless steel and bronze materials which are practically non-corrosive. Flexible bands to conform to pipe irregularities plus pressure-tight soft rubber gaskets insure perfect, permanent fit.

These two clamps meet most pipe repair problems. The upper one is used for small pipes. The lower is useful for pipes of larger diameter.

Another product, the Stauffer Special pipe repair clamp, No. 220 with stainless steel band, is available in sizes from ½ inch and in widths from 3, 6, 9, and 12 inches. This clamp is especially popular with gas utilities. A copper band is available with the repair clamp No. 200-D and is used by water utilities throughout the country. Soft copper bands conform to pipe contours and stop leaks without danger to badly corroded pipe.

These Stauffer pipe-repair clamps all have slotted lugs, which make underwater installation fast and easy. It is not necessary to remove nuts from bolts or "fish" bolts through holes. To install, the workman merely drops the bolts into the slotted lugs and tightens with a wrench.

Adams pipe line repair plugs are obtainable for repairing leaks in large diameter and extremely high pressure pipelines which are not practical.

DIETZ NIGHT WATCH LANTERN

STRAIGHT-LINE, PENCIL BEAM IS VISIBLE FROM ALL ANGLES, NEARBY OR AT REALLY GREAT DISTANCES.

Its exclusive fresnel globe is moulded with optically perfect prisms, designed to concentrate the light rays into a parallel, vertical beam of greatest possible intensity assuring a safety and warning light of greatest visibility. The NIGHT WATCH is the best burning lantern of its kind.

The NIGHT WATCH is strongly made, finished in Contractors' Yellow; Ruby Fresnel Globe with Peep-hole. Also accommodates Dietz Little Wizard and Little Giant Globes. Burns a generous 100 hours. 8" high, 6¾" diameter at non-tip base.

Write for circular.

Exclusive trip-lock releases chimney for easy lighting, etc. Self-locking.

R. E. DIETZ COMPANY · SYRACUSE 1, N. Y.

sure, WE USE SHUREDRY

The word gets around — one fire chief tells another of his successful experience in reducing fire losses with Fulton Shuredry Salvage Covers. We sincerely appreciate this thoughtfulness of our friends, which is not only a strong recommendation for our product, but good gospel for cutting fire losses to a minimum. Fulton's Shuredry Green-Bak Salvage Covers are approved by National Board of Fire Underwriters and by Factory Mutual Laboratories and top every test for water penetration and seepage. When your next equipment order calls for Salvage Covers, we will thank you to specify Shuredry from your fire equipment dealer.

Fulton
BAG & COTTON MILLS
Atlanta • St. Louis • Dallas • Denver • Kansas City, Kans.
Minneapolis • New Orleans • Los Angeles • New York City, 347 Madison Ave. • Winter Haven, Fla.

NOW IN DENVER 5500 *Automatons*

THE DENVER POST: FRIDAY, JUNE 29, 1951

City to Buy 4,000 Parking Meters

A committee of city officials decided Friday noon to accept the bid of the Duncan Meter company of Chicago to supply the city with 4,000 new parking meters at a cost of $205,800.

The Duncan bid was $600 higher than the offer submitted by a company of Oklahoma City, but Traffic Engineer Henry A. Barnes estimated that over the life of the meters, it would cost his department $100,000 to wind the other meter by hand. The Duncan meters are self-winding.

The highest bid on the was $232,000, submitted by a meter company of Canton, Ohio.

The Duncan meters are the type with a glass dome now in use on many downtown streets. The 4,000 new meters, said Barnes, will be used to replace all of the city's old crank-operated type meters.

The decision to buy the Duncan meter was unanimous by the city's parking meter committee.

*Trial order of 225 in 1948; 1310 more added in 1949.

Smart city Administration in Denver. They saw the tremendous money-saving NO WIND advantage of AUTOMATON and acted accordingly. It's a cue any smart administration can follow — when old age necessitates junking present meters — to modernize with the industry's newest, smartest, slickest meter ever invented, that's automatic all-the-way, that earns its keep 12 months of the year by NOT having any winding expense, that boasts a score of advance features other meters may have "some-day", and a patented collection system automatically pilferproof beyond belief. "Advice to a city about to modernize its metered parking" is available upon request. Why not write us today.

FIRST . . . FINEST . . . AND *ONLY* . . .
ONE-MOTION AUTOMATIC METER

Hopwood Photo
Courtesy
Denver C. of C.

835 NORTH WOOD ST. **DUNCAN PARKING METER CORP.** CHICAGO 22, ILL.

Manufacturers of AUTOMATON fully automatic and MILLER manual parking meters.

Cooper-Bessemer Host to Peace Conference Delegates

B. B. Williams, board chairman of The Cooper-Bessemer Corp., Mount Vernon, Ohio, welcomes eight delegates of the Japanese Diet (Parliament) during their visit to Mount Vernon, Ohio, to see a "typical small American city." Left to right are: Mr. Williams; Hewitt A. Gehres, executive vice-president of the company; Kohei Kimura, chairman of the Commission; Akisada Okanishi, Takashi Ono, Eizo Kobayashi, Hideo Yamahana, Toyoji Takeshita, Mashi Aoki, and Shozaburo Sugita.

Street Warning Signs Have Alternating Flash

Danger and warning street signs equipped with Winko-Matic alternating flash attracts the motorist's instant attention. According to The Winko-Matic Signal Co., 750 Broadway, Lorain, Ohio, its equipment increases the protection value of signs, assures visibility for at least a mile, can be quickly and easily installed on existing signs at minimum cost of time, and is readily adapted to any type of sign.

The company claims that its signal is "best by obedience test" and has 100% target value.

Winko-Matic is sealed against the wind, rain or snow, is not affected by heat or cold, and has no radio interference.

Specifications include: standard size for 24-inch sign, other size fits all standard 30-inch warning signs, and an all-steel weather-tight case.

STOP LEAKS

Quickly! Permanently!

. . . with ADAMS Pipe Line Repair Plugs. Seals leaks in large diameter and high pressure pipe lines in a matter of seconds.

Installed by screwing into hole and welding.

Write for literature.

Adams

PIPE LINE REPAIR PLUGS

STAUFFER MFG. CO.

2453 Merced Avenue • El Monte, Calif.

CUTS ICE and SNOW REMOVAL COSTS

Will your Salt Spreader

1. Apply de-icing salts uniformly in an even "bird--shot" melting pattern in any width from 4 to 30 ft.? No bare spots; no streaks?
2. Be self-leveling so you can run bulk salt into it from an elevated dump body?
3. Be adjustable for height?
4. Have ALL vital parts made of stainless steel—including the material hopper?
5. Have its engine AND engine controls completely enclosed in a weather tight compartment?

The "Scotchman's" proven air-blast method of spreading salt in a perfect light, uniform "bird-shot" pattern does NOT grind or pulverize your salt into a useless powder.

A DEPENDABLE, STAINLESS STEEL, ELECTRIC SELF-STARTING "Scotchman" is still the most efficient spreader of de-icing salts — bar none!

Ask for FREE DEMONSTRATION

TARRANT MFG. CO., East Ave., Saratoga Springs, N. Y.

The Federal Civil Defense Administration recommends large powerful units for basic coverage,—and specifies the use of the DECIBEL as the only measure of a siren's effectiveness! The F.C.D.A. points out in Bulletin 38 that DB. ratings are required for determining the number of sirens needed in your community; that specifications should include DB. ratings. The F.C.D.A. suggests economy of control and power connections by using large units, stressing the advantage of rotating over stationary units for overall coverage. (One rotating siren does the work of 6 stationary units!)

H. O. R. makes both types of sirens: Stationary: 2, 5, 7½ H.P.; Rotating Super Sirens: 15 and 40 H.P. The rating of this 40 H.P. siren is 132 DB. You can compute the tremendous carrying and coverage ability!

H.O.R. COMPANY, INC.

Western Representative
WESTERN CONTINENTAL
EQUIPMENT CORP.
Colorado Springs, Colorado

H. O. R. COMPANY, Inc.,
40 Broadway, Staten Island, N. Y.

Please send details and data: H. O. R. Super Sirens.

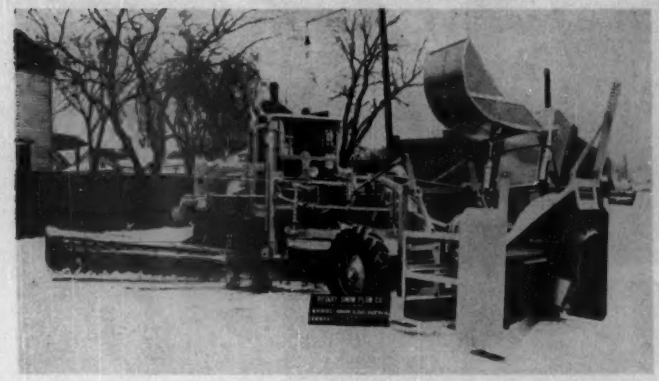
Name .....

Address .....

City .....

Some Eastern Dealerships available.

Snow Blower and Grader Combined



The combined clearing action of a grader, wing plow, and snowblower go into a single unit. This shows a Snow King blower mounted on a Caterpillar grader. The blower is a product of the Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn.

Appointments at Toro

David M. Lilly, president of the Toro Mfg. Corp., 3042 Snelling Ave., Minneapolis 6, Minn., announced the appointments of Alan F. Kelsey as general manager of the Minneapolis plant, and Charles B. O'Neill as assistant to the president. Toro manufactures power lawn mowers.

Mr. Kelsey had been senior project engineer for the Boeing Airplane Co., where he was responsible for engineering problems concerning C-97 transport and B-50 bombers.

Before joining Toro, Mr. O'Neill was director of purchases and vice-president of the Tecumseh Products Co., Tecumseh, Mich.

Diesel Engine for Sale

One used Fairbanks-Morse stationary diesel engine for sale. Engine serial No. 626148, Model 32-858-B, 180 horse power, style V. A. This unit may be purchased reasonable.

Write:

Zenno A. Gorder, Supt.
City Water Dept.
Monroe, Wisc.

Detectron 505
PIPE DETECTORS

FIRST With a Metal Case
FIRST With Shielded Loops
FIRST With "Sure Grip" Handle
FIRST With Lifetime Guarantee

The new DETECTRON Model 505 locates, traces and centers pipes and cables with speed and accuracy. Small, compact, lightweight — with HEAVY DUTY PERFORMANCE.

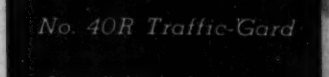
★ HIGHER QUALITY
★ LONGER LIFE ★ LOWER PRICE
TRIPLE VALUE!

For Complete Information Write for Folder 10-R

Eastern Representative
HATHAWAY SPECIALTIES CO.
BRADFORD, R. I.

THE Detectron CO.
5437 CAHUENGA BLVD. NORTH HOLLYWOOD, CALIF.

EMBURY
Traffic-Gard
The 100 Hour Lantern



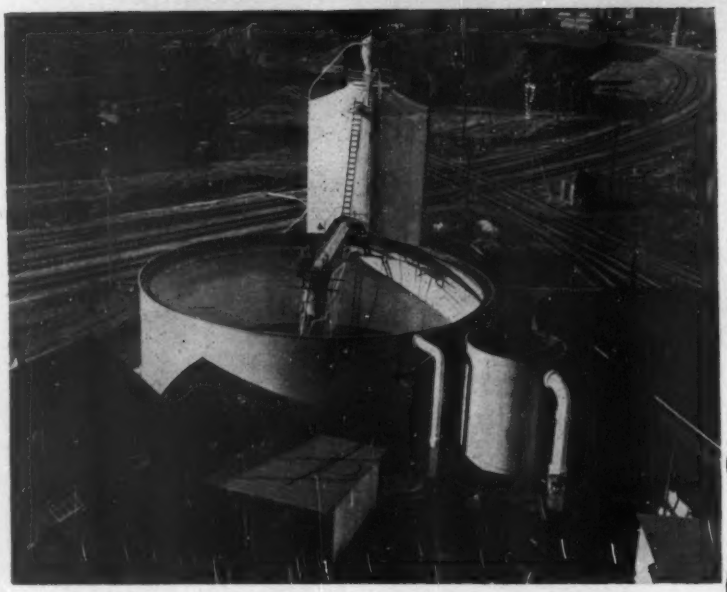
No. 40R Traffic-Gard

- Stays lighted 100 hours and more on 18 oz. of kerosene.
- Lighthouse type lens . . . magnifies flame into far-reaching safety beam.
- Cooler burning . . . minimizes lens replacement.

Write EMBURY MANUFACTURING CO. WARSAW, NEW YORK, U. S. A.

EMBURY
LANTERNS & TORCHES

WHERE THE EYES ARE THIS MONTH



Among the many successful installations that Refinite has made during the past few years, is the one pictured above. The unit is 60 feet in diameter by 20 feet high. It produces 4.5 million gallons of sparkling clear water daily. The installation was made in 1945 for the Farm Crop Processing Plant, Omaha, Nebraska.

. . . Probably one of the nation's toughest water to condition is that of the muddy Missouri that is known for its high turbidity. An unbroken record of daily satisfactory water conditioning service has caused the Refinite Directors to select this installation for their first advertisement — one of a series — to carry the title: "WHERE THE EYES ARE THIS MONTH."

Refinite

WATER REFINING EQUIPMENT

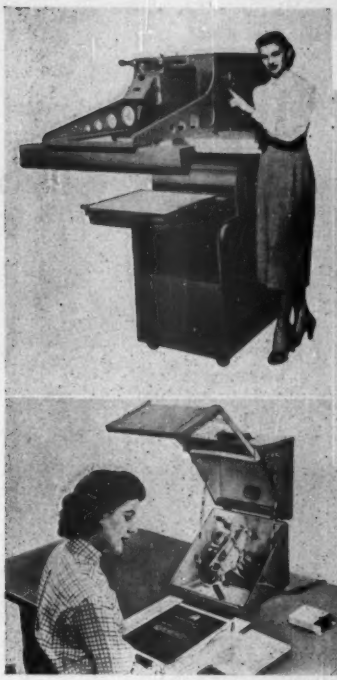
OMAHA, NEBR.

REFINITE *Serves the World*

. . . and Refinite wants to serve you, too! Regardless of your water treatment problem . . . iron, turbidity, hardness, bad taste or odor . . . you will find that Refinite has the Right Answer. Today, write or phone for new special bulletins that will answer many of your water conditioning questions and show how Refinite's Engineers can help you. No obligation. Address: Refinite Corporation, P. O. Box 1312, Omaha, Nebraska.

P.S. Refinite also manufactures low cost, efficient units to soften water for individual homes. See your local dealer, or write for literature.

Making Photocopies and Reading Microfilms At Point of Use



Roll the Record Dexigraph (photographed upper left) to the records for copying full to half size.

All-purpose Dual Film-a-Record (above) copies both sides of a document simultaneously or one side only on either 16mm or 35mm film, photographing up to 500 checks a minute.

Portable microfilm reader (at the left, for desk-top or field use.

Where the copying of records and the office use of the records used to be separate operations, both can now be performed without confusion or delay. The Record Dexigraph can be rolled from one department to another for the photographic copying of records at the rate of 150 photocopies per hour, same size or down to half size. It plugs into any electrical outlet.

Three new 16mm and 35mm readers provide a portable microfilm reader for desk and field use, a Library model for viewing extra-large images, and a Film-a-Record reader for standard office use. All three readers were designed and built by Griscombe Products, Inc., of New York City, and feature high-quality lenses specially coated to reduce reflection and improve contrast. Weighing only 17 pounds in its case, the Griscombe portable, shown here, is not only intended for desk-top viewing, but will project images on vertical screens or light-colored walls for group reference.

The library reader is equipped with an 18 by 18-inch screen, large enough to accommodate a full newspaper page at 17 magnifications. As with the other readers, there is no need to darken the room. Only 11 pounds heavier than the portable, the Film-a-Record model is manually operated, magnifies the image either 24 or 43 times.

For illustrated folders describing the microfilm readers and the new portable Record Dexigraph camera, write Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y.

AMERICAN PLAYGROUND DEVICE CO.

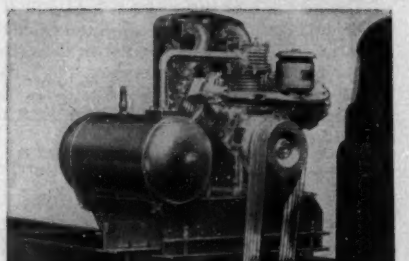
WORLD'S LARGEST MANUFACTURERS OF FINE PLAYGROUND, SWIMMING POOL AND PHYSICAL FITNESS EQUIPMENT

ANDERSON, INDIANA

Costs $950 to $1000 less to buy and 50% less to maintain than trailer compressors

Jaeger truck-powered "Travel-Air"

Delivers 125 cfm at 100 psi—enough air to run 2 heavy breakers at full pressure—when truck engine is running at easy 1750 rpm. Simple power take-off is controlled in cab. Engine speed automatically regulated by air demand. 2-stage, air-cooled, force feed lubricated compressor unit.



Easily installed on Ford, Dodge, International, GMC, Chevrolet 1½ and 2 ton rated, long wheelbase trucks.

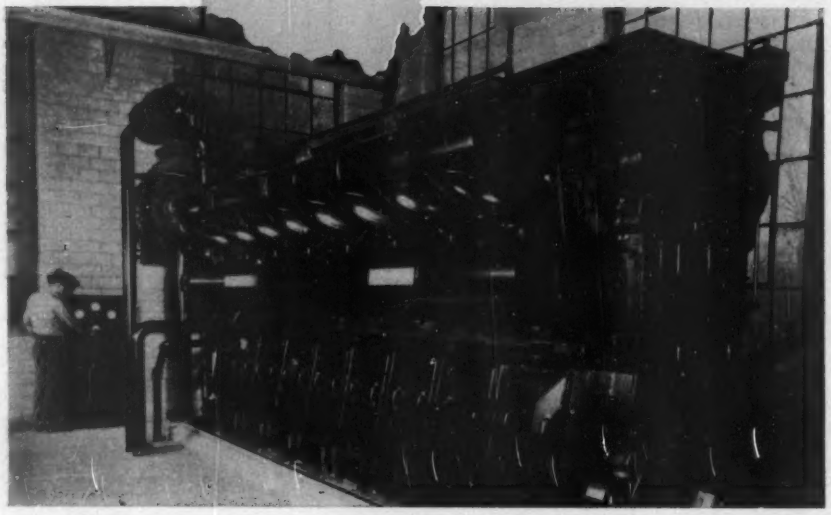
Sold, serviced by distributors in 130 cities. Send for Catalog TC-1.

THE JAEGER MACHINE COMPANY, 505 Dublin Avenue, Columbus 16, Ohio

NEW SUPERIOR DIESELS

"Take Power Plant Out Of The Red"

at Newton Falls, Ohio



1440 hp, 8 cylinder supercharged SUPERIOR Diesel Model 80

Almost three years have passed since the first SUPERIOR Diesel was placed in operation at Newton Falls, Ohio, and its economy and operating efficiency have become a matter of public record.

The addition of this 1000 KW SUPERIOR Diesel generator set in 1948 increased the efficiency of this plant over 14% as compared with the other engines which had served this community. The industrial and residential demands increased rapidly during the thirty-three month period that the SUPERIOR Diesel carried almost the entire load.

As a result of its greater efficiency, Newton Falls has just purchased two more SUPERIOR Diesel generating sets of the same capacity.

This performance record typifies the experience of SUPERIOR and ATLAS Diesel users throughout the world. It's conclusive proof of the fuel economy you can expect when you invest in efficient 4-cycle, precision-built SUPERIOR and ATLAS Diesels. You can get the full account of this and other installations by writing the Engine Division for Bulletin 4812.

Superior ENGINES · ATLAS Imperial DIESEL ENGINES

THE NATIONAL SUPPLY COMPANY

ENGINE DIVISION

Plant and General Offices: Springfield, Ohio

DIESEL ENGINES • DUAL FUEL ENGINES • GAS ENGINES

Buffalo Sales Manager For Ryerson & Son

C. S. Gedney, plant manager, announces the appointment of Paul L. Wright as sales manager of the Buffalo, N. Y., plant of Joseph T. Ryerson & Son, Inc., steel distributors, whose main office is at Chicago 80, Ill.

P. L. Wright

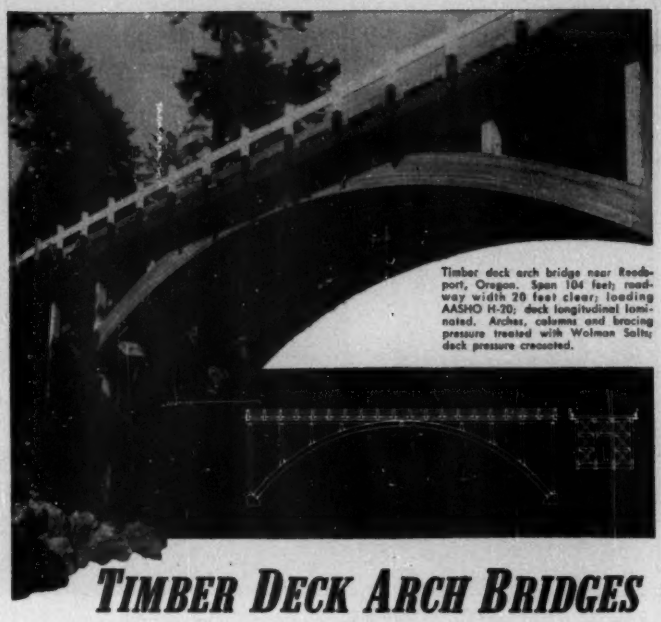
He joined Ryerson in 1939, and in 1946 was named sales representative in the Chicago area. The following year, Mr. Wright was transferred to the company's Buffalo plant as supervisor of inside sales activities and as office manager.

Heads Two-Way Communications Unit

W. W. Hamilton, recently vice-president of Vetric, Inc., and before that, sales manager of F. E. Dine & Co., has returned to the Avia Products Co., 7266 Beverly Boulevard, Los Angeles, Calif., to head the company's new two-way radio communications division, according to L. E. Stanley, Avia president.

Mr. Stanley reports that design and production of two-way radio units for use by law enforcement agencies on motorcycle equipment will be the primary project of this division. Prototype models of other equipment, designed for lightweight portability in disaster work, are already on the drawing boards.

L. E. Stanley, president of the Avia Products Co., listens to a demonstration of the company's new two-way communications system for motorcycles, as demonstrated by communications chief, W. W. Hamilton. The motorcycle is manufactured by the Harley-Davidson Motor Co., Milwaukee 1, Wis.



Timber deck arch bridge near Reedsport, Oregon. Span 104 feet; roadway width 20 feet clear; loading AASHO H-20; deck longitudinal laminated. Arches, columns and bracing pressure treated with Wolman Salts; deck pressure creosoted.

TIMBER DECK ARCH BRIDGES

... quick, economical construction for traffic of the future

Tremendous load carrying ability, lasting soundness and ready availability of glued laminated arches make them ideal structural members for economical, permanent bridges. Formed of kiln dried lumber and bonded with waterproof glues as permanent and strong as the wood itself, these arches are free from seasoning action. They require no maintenance through the years.

Deck arch bridges are most practical over canyons with walls to contain the horizontal thrust. Pier height is held to a minimum, yet the bridge deck is raised well above the water level. With no overhead members of any kind, road clearance is unlimited. Roadway may be of any accepted material.

Approved Preservative Treatments Available

With proper preservative treatment the timber bridge will give a lifetime of trouble-free service, lasting far beyond the time when changing traffic demands necessitate highway relocations and a new site. Any of the approved treatments is available for Timber Structures bridges.

The deck arch bridge is only one of several types fabricated by Timber Structures, Inc. Details of the various types are contained in folder, "Permanent Timber Bridges". A copy of this folder is ready for you at your nearest Timber Structures office. Or send us the filled-in coupon, and your copy will reach you promptly.

TIMBER STRUCTURES, INC.

P. O. BOX 3782-X, PORTLAND 8, OREGON

Offices in New York; Chicago; Kansas City, Missouri; Dallas, Texas; Seattle and Spokane, Washington

TIMBER STRUCTURES, INC. OF CALIFORNIA • Oakland, California

TIMBER STRUCTURES, LTD. OF CANADA • Peterborough, Ontario

Local Representatives throughout the United States and Canada

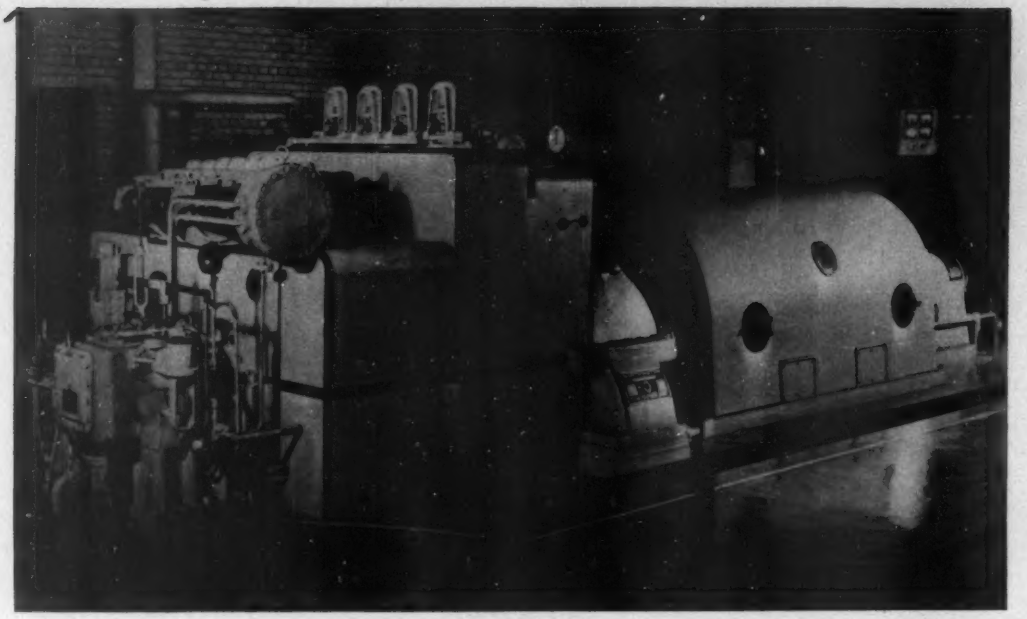
TIMBER STRUCTURES, INC.
P. O. Box 3782-X, Portland 8, Oregon
Please send me your folder "Permanent Timber Bridges".

Name_____

Company_____

Address_____ Zone_____

City_____ State_____



Story of an Economy Drive

How the Worthington Steam Turbine Pays Dividends for the City of Litchfield

What happened at Litchfield, Minnesota, is a clue to a most economical power plant operation.

Originally, the Litchfield municipal power plant consisted of low-pressure boilers, a steam engine and a small turbine-generator unit. The exhaust steam is sold for municipal heating.

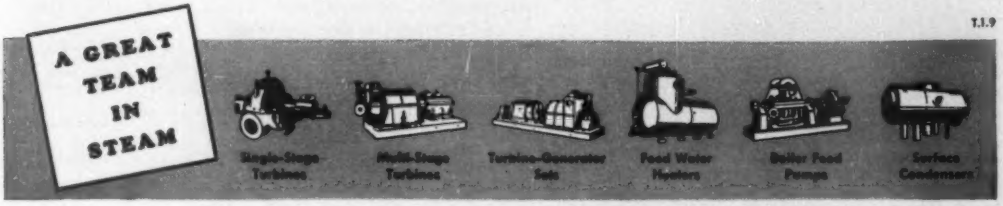
Next—a Diesel engine-driven generator was installed. The load grew, and finally, after a careful survey, it was decided to install a 3000-kw Worthington turbine generator and automatically extract steam for heating purposes.

Worthington builds steam turbines in all types and sizes—and turbine-generator sets up to 10,000-kw. For proof *there's more worth in Worthington*, call our nearest office or write to Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.

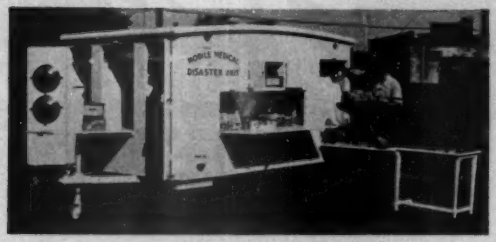
WORTHINGTON

STEAM TURBINE GENERATORS

T.I.9



Mobile Medical Disaster Unit



Emergency hospital on wheels

The mobile medical disaster unit, manufactured by Emergency Aids Co., 3444 N. Clark St., Chicago 13, Ill., is a trailer unit that is an emergency hospital on wheels, declares the company. The medical first aid that can be given from it can be expanded to the amount of medical supplies, splints, and plasma that would be stocked in the unit.

Some of the equipment of this self-contained unit includes: 2 folding operating tables; 9 oxygen outlets; gasoline generator for light and power; two Collapsi-Cot emergency stretchers; a 30-gallon-capacity water storage tank; electric hot water heater; storage battery for starting generator, and a simple car hitch that fits practically any car bumper.

Built on a steel frame, heavy-duty combat chassis, the unit is 6½-feet wide, 10-feet long, and 5½-feet high, and is well-balanced for street travel through debris and rough terrain.

The manufacturer states that its product answers a definite need for civil defense equipment planning.

Consulting Engineers

Marvin O. Kruse has acquired the consulting engineering practice of Leon L. Schoel and Associates, Spencer, Iowa, and will continue the work under the name of the Kruse Engineering Service, consulting engineers.

The practice consists of consulting work for municipalities in northwest Iowa and southwest Minnesota, and includes work on street improvements, sewers, sewage-disposal, water-treatment and power plants, and drainage.

Double-Faced, Accident Prevention Signs

A Positive Warning Both Ways

ENAMEL FABRIC

MEN WORKING

REDTECO (WHITE ON RED)

YELTECO (BLACK ON YELLOW)

Clear Cut Lettering—Will Not Crack, Peel or Break—Light Weight Permits Safe, Easy Posting Reflectro Letters For Night Use

WRITE FOR CIRCULAR

THOS. E. COLLINS & CO.

4661 Maryland Ave., St. Louis 8, Mo.

The

SEWER SCOOTER*

* Trademark

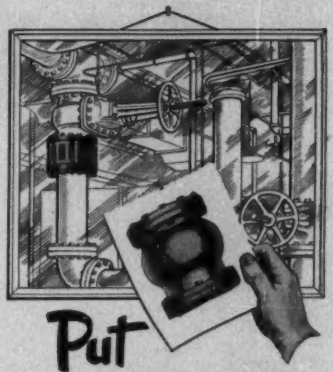
Sewers Clean Themselves With a Sewer Scooter

100% self-propelled for 6" to 96" sewers—Is equally effective for all conditions and problems of sewer maintenance—completely cleans sewers of all sediments: rocks, gravel, sand and "hard-to-move" sludge. Quick and efficient in operation. Investigate today! Ask for Bulletin.

Dealers—Some good territory open

Fitzgerald Engineering Co., Inc.

P. O. Box 289-G, Coral Gables 34, Fla.



Put WILLIAMS-HAGER flanged Silent CHECK VALVES into the Picture-

and your **WATER HAMMER** WORRIES ARE OVER

When you install Wiliams-Hager flanged Silent Check Valves in your water system, you complete the happy picture of a plant . . . rid of costly water hammer. These dependable valves provide positive protection in any position including angular, horizontal and vertical with flow either upward or downward. Disc and seat are renewable—conical spring is non-wearing. Easy to install or reseat, they are available in standard pipe sizes from 1" to 20".

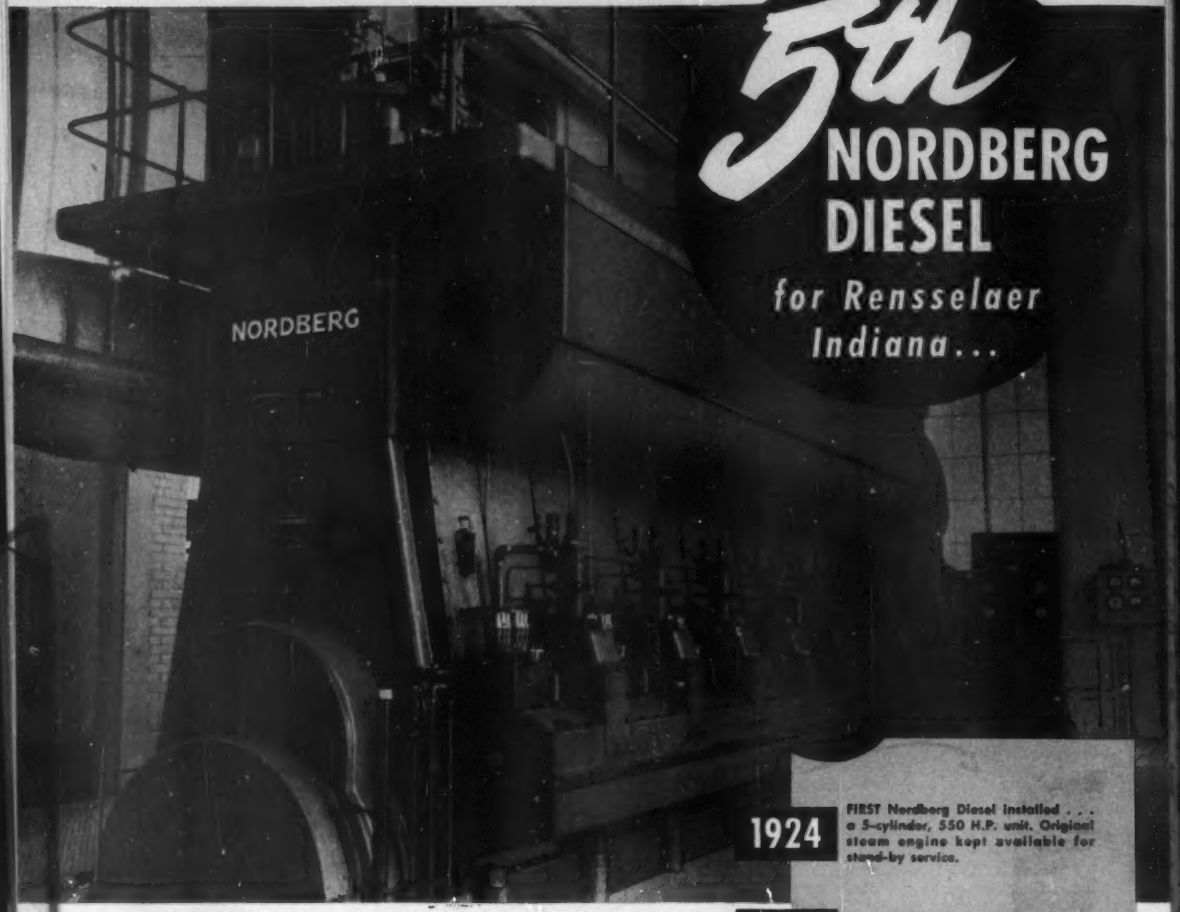
Write today for Bulletin WH-100.

CHECK VALVES

THE WILLIAMS GAUGE CO.

Pump Valves . . . Water Gauges . . . Gauge Cocks . . . Steam Traps . . . Pump Governors . . . Feed Water Regulators . . . Water Columns

3013 PENNSYLVANIA AVE. • PITTSBURGH 33, PA.



5th NORDBERG DIESEL

for Rensselaer Indiana...

1924 FIRST Nordberg Diesel installed . . . a 5-cylinder, 550 H.P. unit. Original steam engine kept available for stand-by service.

1928 SECOND Nordberg installed . . . an 875 H.P. unit driving a 600 K.W. generator. Steam plant abandoned.

1932 THIRD Nordberg installed . . . developing 1425 H.P. and 1000 K.W. New building erected and old plant razed.

1940 FOURTH Nordberg installed . . . a 6-cylinder, 1500 H.P. unit, bringing the plant capacity up to 4350 H.P.

1950 FIFTH Nordberg Diesel installed . . . a 7-cylinder, 21½" x 29", 2900 H.P. unit, driving a 2400/4160 volt, 1980 K.W. generator. Total plant capacity now 7150 H.P.

OUTLINED here are highlights of the development of the municipal power plant at Rensselaer, Indiana . . . a plant started in 1898 with a 60 H.P. steam engine belted to a 1,000 volt generator, and progressing through 53 years until a total of five Nordberg Diesels were installed to handle the ever increasing load.

The fifth Nordberg now carries a large part of the plant load, operating from 14 to 16 hours each day until the load drops to where smaller units can handle it more economically. Comparing present day output of this new Diesel with that of the plant when Diesels were first installed, we find that in two months the new 2800 H.P. unit generates an amount about equal with the entire annual output in 1925. In one month, this unit generated 475,500 K.W. hours at the rate of 13 K.W. per gallon of fuel, carrying an average load of 54%. Lighting rates at Rensselaer have been among the lowest in Indiana . . . thanks to dependable, low cost Nordberg power.

Here again is a typical example of the way in which Nordberg Diesels provide the economical answer to municipal and industrial power problems. Write for details on a Nordberg engine to meet your requirements—in sizes from 10 to 9600 H.P.

NORDBERG MFG. CO., Milwaukee 7, Wis.

P1050

BUSCH-SULZER
A DIVISION OF NORDBERG

NORDBERG
DIESEL ENGINES

This page means SERVICE...

With a Smile

That is, if you need information on any manufacturer's products, whether mentioned or not in this issue of THE AMERICAN CITY, we will procure it for you free of charge.

If you need such information, use this business reply card. It needs no stamp. Just drop it in the mail.

See reverse side

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 281, SEC. 34.9 P. L. & R., NEW YORK, N. Y.

THE AMERICAN CITY MAGAZINE

470 FOURTH AVENUE

Catalog Supply Dept. NEW YORK 16, N. Y.

Free Catalog Supply Service

For readers of THE AMERICAN CITY

When checking equipment in this issue of THE AMERICAN CITY, your attention is directed to these sections:

1. The catalog listings, to be found on pages 25, 27, 28, 30, 31 and 34. Each listing has a number. Write the numbers of the catalogs you wish to receive on the reply card below.

2. The "Municipal Purchasing News" section, pages 161 through 198, where descriptions and illustrations of equipment and services are to be found. If you need additional information on any of these, jot down on the card the name of the product and its manufacturer.

In addition, should there be equipment not mentioned in this issue about which you would like information—such as manufacturer's name, source of supply, etc.—make your inquiry on the card. We'll do the rest.

To THE AMERICAN CITY's Catalog Supply Department,

Please send literature on items numbered as follows, starting on page 25:

.....

.....

Please send me further information on the following products described in this issue:

.....

.....

I would like to receive also manufacturers' booklets on.....

.....

.....

NAME .....

TITLE .....

ADDRESS .....

..... 10-51

Fill in the attached card—tear off along dotted lines, and drop in mail-box.

Changes at Solvay Sales

J. H. Elleman V. W. Aubel, Jr.

The Solvay Sales Division of the Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y., announces that John H. Elleman, manager of the Calcium Chloride Department, has been promoted to the position of assistant director of sales of the division. Verne W. Aubel, Jr., is the new calcium chloride manager.

Colonel Elleman was field engineer in Solvay's Calcium Chloride Department for several years before the war. After serving as district engineer with the Army Corps of Engineers, he returned to the company to head its calcium chloride group.

Mr. Aubel has been with the company for 12 years and was a salesman in the Philadelphia and St. Louis territories. After 3 years with the Navy in the South Pacific, he returned in 1946 and became assistant to Colonel Elleman at Solvay.

. . . with a
GREENLEE PIPE PUSHER

Speed jobs with this quick, simple way to install underground pipe. With the GREENLEE *one man* pushes pipe under obstacles . . . no tearing up of pavement, floors, lawn . . . eliminates extensive ditching and tedious backfilling! Two models and special power pump to fit your various jobs. Write for facts today.

GREENLEE

Greenlee Tool Co., 2030 Columbia Ave., Rockford, Ill.

El Paso Reports: "Definitely cuts costs on landfill garbage disposal"

D TOURNAPULL moves 785 cu. yds. garbage . . . 120 yds. dirt blanket per day

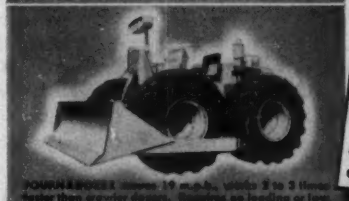
TO modernize their garbage disposal, the city of El Paso, Texas, recently purchased an electric-control, rubber-tired D Roadster Tournapull. With addition of dozer blade, their "D" functions as an all-purpose city utility tool. According to Ed. F. Muckelroy, Supt. of Sanitation, "Comparing unit with crawler-tractor, same amount of material can be covered *in half the time*. Unit definitely cuts costs of landfill garbage disposal." Here's how it works:

Dozes, covers on same pass

Refuse is dumped at fill site from trucks. One-man operated Tournapull bull-dozes refuse down slight grade and covers it on same pass. At bottom of grade, "D" self-loads dirt in 7-yard scraper, then spreads it on return. Wide 18.00 x 25 low-pressure tires, compact refuse on normal cycle. Simple, fingertip electric switches speed all dozer and scraper operations . . . response is instantaneous.

Fast-moving D Roadster makes profitable use of idle time . . . goes anywhere in city at 28 m.p.h. to handle scattered municipal maintenance assignments. Maintains alleys . . . hauls, spreads cinders and gravel surfacing, grades parking lots. Can also plow as well as load and haul snow and ice from city streets. Mobile "D" is always ready to drive at a moment's notice.

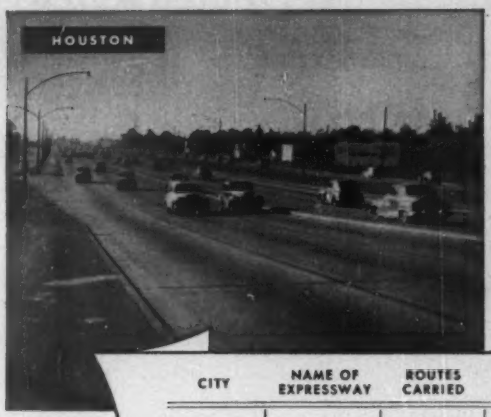
Consider how much more work per tax dollar D Tournapull can do for you, then contact your LeTourneau Distributor for all the facts on how you can make your municipal appropriation go farther.



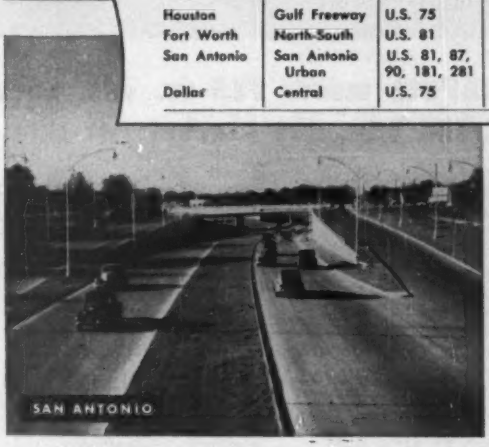
Mail today to:
R. G. LeTOURNEAU, Inc., Peoria, Ill.
for complete information on 122 h.p., rubber-tired
D Tournapull
D Tournadozer
NAME
TITLE
DEPARTMENT
CITY, STATE

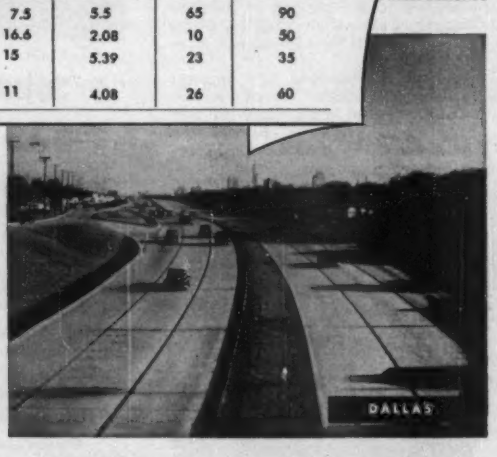
Tournapull—Tournadozer—
Trademark Reg. U. S. Pat. Off. M87

LeTOURNEAU TOURNAPULLS
MORE WORK PER HOUR WITH RUBBER-TIRED POWER



CITY	NAME OF EXPRESSWAY	ROUTES CARRIED	LENGTH IN MILES PLANNED	LENGTH IN MILES COMPLETED	Traffic (in thousands of V.P.D.) NOW	Traffic (in thousands of V.P.D.) ANTICIPATED
Houston	Gulf Freeway	U.S. 75	7.5	5.5	65	90
Fort Worth	North-South	U.S. 81	16.6	2.08	10	50
San Antonio	San Antonio Urban	U.S. 81, 87, 90, 181, 281	15	5.39	23	35
Dallas	Central	U.S. 75	11	4.08	26	60





How Four Texas Cities Are Solving Traffic Problems with

Concrete Expressways

THE photos above show completed sections of four expressways under construction in Texas. They illustrate how these four progressive cities are solving urban traffic problems with concrete expressways to meet today's—and tomorrow's—needs.

Many other cities from coast to coast have found that modern expressways are the solution to a variety of traffic headaches. Expressways, by limiting access, eliminating crossings at grade and separating opposing streams of traffic, provide for a safe and continuous flow of traffic. They also contribute to the development of central business districts by making them accessible to larger areas and permit orderly community growth by removing through traffic from local streets. Property values usually increase, too, with improvements in transportation.

Because expressways carry heavy weights and volumes of traffic, most cities build them with concrete. Concrete expressways usually cost less to build than other pavements of equal load-carrying capacity, cost less to maintain and last longer. The result is ***low-annual-cost*** service. For more information write today for free booklet on concrete expressways. Distributed only in U. S. and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. A10-4, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

New Electric Utility Line Truck Replaces "Old Faithful" Which Served 22 Years

What has happened to electric utility line trucks is demonstrated by the two units shown in the accompanying photographs. A "retirement" ceremony was held for the 22-year-old White truck operated by the Western Massachusetts Electric Co. The equipment is manufactured by The White Motor Co., Cleveland 1, Ohio.

The old "veteran" just retired, is shown at the upper left. Its replacement is at the right.

"Old Faithful" has operated more than 100,000 miles for this utility in its northern division. The Model 57 White truck was delivered in Greenfield in 1928. Made with a 4-cylinder chassis with 1½-ton body, it was equipped with gas lights and was one of the first vehicles in Greenfield to sport a windshield, reports the electric company.

After 5 years of service in the line department, it was re-outfitted for service in the underground department. The cab was closed in and a heavy-duty open body was installed. It was equipped with a hand-operated side arm derrick.

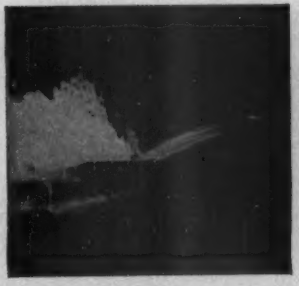
Replacing "Old Faithful" is the newest type of utility truck, a White 3000, fully equipped for modern service, even to a two-way radio telephone, enabling the crew to keep in constant touch with supervisors and other divisions for emergency service.

WATER COSTS GO DOWN when you install CAISSON WELLS

Caisson Well means:
LIFELONG INSTALLATION and LOW WATER COST

Would you believe that water can now be produced at a cost of less than 2 cents per 1,000 gallons, including pumping, operation, maintenance and amortization?

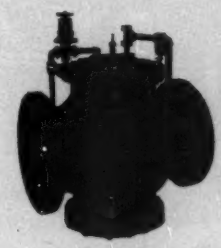
LET US PROVE IT TO YOU



CAISSON WELLS, INC.
Ground Water Engineers and Contractors
33 W. 42nd St., New York 18, N. Y.

Are You—
WASTING WATER?

ELIMINATE WILFUL AND UNNECESSARY WASTE BY INSTALLING ROSS VALVES TO EFFICIENTLY REGULATE DISTRIBUTION PRESSURES.



PRESSURE REDUCING VALVE
Maintains constant reduced pressure at downstream side of valve

ROSS
1879
AUTOMATIC CONTROL VALVES AND SPECIALTIES

BACK PRESSURE VALVE
Maintains constant back pressure at upstream side of valve.

COMBINATION PRESSURE REDUCING and BACK PRESSURE VALVE

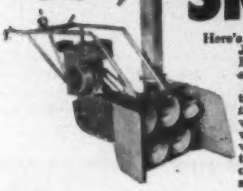
OTHER ROSS PRODUCTS:
- ALTITUDE VALVES
- FLOAT VALVES
- RELIEF VALVES
- STRAINERS
- HYDRAULIC BOOSTER PUMPS and SPECIALTIES

Write for Our Catalog No. 50

ROSS VALVE MFG. CO., Inc.
8 OAKWOOD AVENUE TROY, N. Y.

Greatest Advancement in Snow Plow History!

TRIO SNOW JET



Here's big news in Snow Plows! The SNOW JET—a 30" Double Rotary Snow Plow with 7½ H.P. gasoline engine and rugged, never-stop endless track.

Walks through *any* snow at desired throttle speed. A real *Little Giant of the North!* Designed for easy maneuverability; built for the worst that winter can offer. Shifts forward, reverse and neutral. When in neutral there is live blower power for blowing out deepest drifts. Six foot spout swivels any direction.

LITERALLY EATS IT UP . . . AND BLOWS IT AWAY!

TRIO ROTARY SNOW PLOW

Farmers, municipalities, townships, counties and many others need this Six Foot Double Rotary Snow Plow. Designed to move more snow faster, easier, at less cost. Easy to mount on most any truck or farm tractor. Acclaimed by users throughout Minnesota and Dakotas, where winters are most severe.

Write, Wire or Phone for complete literature!

DAHLMAN EQUIPMENT SALES CO.

300-302 N. PRIOR ST. PAUL 4, MINNESOTA

PREVENT PARKING METER "FREEZE-OUTS"

WITH

LOCK-EASE®

Graphited LOCK FLUID

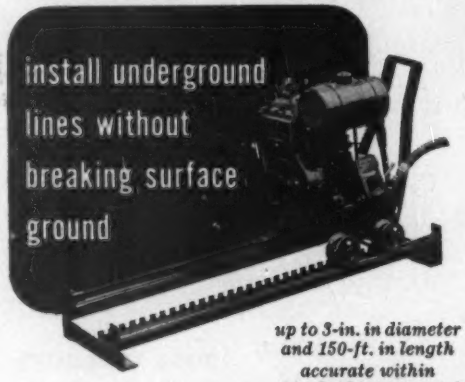
Condition your city's parking meters against operating failures due to freezing, sticking or rust. Use LOCK-EASE, a specially compounded lubricant that seals out moisture and dust. Penetrates quickly, leaves a graphited, rust proofing film on working parts. Lowers maintenance . . . prevents loss of revenue and annoyance to public.

- Endorsed by parking meter manufacturers and locksmiths.
- Available in a four-ounce Controlled Flow "drop or stream" container.
- Easily applied through lube holes or keyways.
- An all-weather product to prevent freezing due to moisture, dirt and corrosion.

Order from hardware or auto jobber or write.

AMERICAN GREASE STICK COMPANY
Muskegon, Michigan

AGS



up to 3-in. in diameter and 150-ft. in length accurate within 1-inch of target area!

FOR WATER, GAS, SEWER, TELEPHONE, TRAFFIC SIGNAL AND MANY OTHER TYPES OF LINES!

Bore a 3-inch hole at 1½ f.p.m....with automatic warning of underground hazards. The EARTHWORM bores 1000 feet of underground line per gallon of gasoline. Use pipe or conduit as drill stem sections and leave as permanent installations. Save pavement and labor...save thousands of dollars per year...with the proved-in-the-field advantages of EARTHWORM!

IMMEDIATE DELIVERY! SEND FOR DETAILS!

LUBE-JACK CO.

P.O. BOX 1100
Santa Monica, California

For Sale

1—24 ton Nichols-Herreshoff Multiple Hearth Burner, used only a few months

1—30 ton Trash Burner.

For further information, contact

Mr. J. R. Palmer,
Director of Public Works
City Hall,
Rock Island, Ill.

VALVES FOR SALE

4—16" Chapman #581½, FE, DD, OS&Y Gate Valves with HWs, Open Left.

2—Chapman Elect. Motor Operators.

NRS. 790 RPM No. Load. 7½ Ft. Lbs. LR Torque. SG8843.

5—16" Rensselaer List 11, HE, SGs, Indicators, with HWs, O.L.

The above have had short service but are factory reconditioned and equal to new. Also a number of others, both new and used, in sizes thru 30".

Write: Box 1183
Glendale, Calif.

Tractor-Shovels

These 28½-yard Hough Payloader tractor-shovels were recently delivered to the Indiana State Highway Commission to expedite highway maintenance operations throughout the state. They will be employed for truck-loading, material-handling, and miscellaneous earth-moving jobs. This photograph was taken at the factory of the Frank G. Hough Co., 710 Sunnyside Ave., in Libertyville, Ill.

Centrifugal Concrete Street Lighting Standards

Concrete standards for street and highway lighting are made by the centrifugal process which, the company explains, assures a low water-cement ratio and produces a concrete of maximum density and exceptional strength. Steel rods, under tension, minimize deflection and retain the reinforcing in proper position. Following a specially developed moist steam curing process, the standards are wet-ground and polished to expose the sparkling aggregate and produce a smooth, attractive granite finish.

The manufacturer, the American Concrete Corp., 4727 North Lamon Ave., Chicago, Ill., states that the standards provide beauty, economy, and durability for every street lighting need.

The standards are available in a large number of sizes and types. Most designs are available with precast butt base, bolt-down base, or transformer base as required. The equipment is engineered to better withstand loads, stresses, and impact, and remains permanently unaffected by exposure to salt air conditions and other normally corrosive substances.

Laboratories' Managers

The Robert W. Hunt Co. reports that W. H. Bolger has been advanced to manager of laboratories, and Cromwell Bowen to assistant manager of laboratories.

The engineering company which specializes in inspection, tests, and consultation, has its general offices at 175 W. Jackson Boulevard, Chicago 4, Ill.

What do you expect of a COAGULANT?

TENNESSEE CORPORATION Ferri-Floc FERRIC SULPHATE

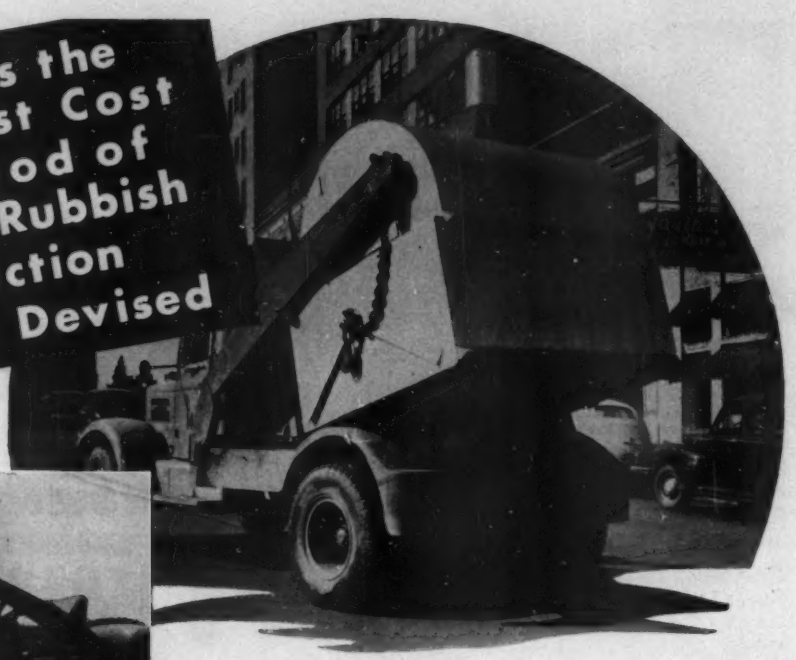
1. Rapid Floc Formation?
2. PH correction?
3. Taste and odor control?
4. Color removal?
5. Softening?
6. Ease of operation?
7. Bacterial removal?
8. Manganese and Silical removal?
9. Turbidity removal?
10. Economy?

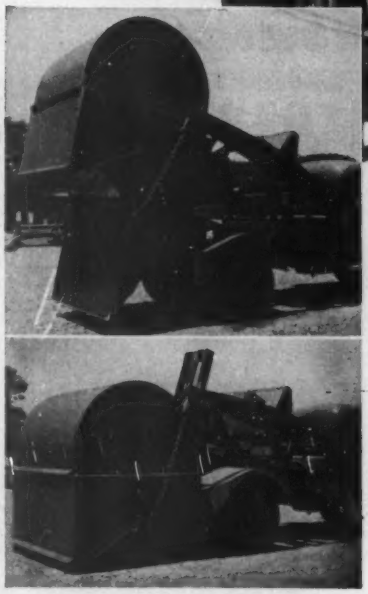
If you are looking for any or all of the above, then the answer is FERRI-FLOC.

We would like to send you, without charge, our new booklet on economical and efficient Coagulation. Just send a card or letter to Tennessee Corporation, Grant Building, Atlanta, Georgia or Lockland, Ohio.

TENNESSEE TC CORPORATION

Here is the Lowest Cost Method of Bulk Rubbish Collection Ever Devised





PICK UP, HAULING AND DUMPING operations are shown above. Large photo shows Dempster-Dumpster hauling a pre-loaded 10 cu. yd. container from downtown Nashville to sanitary fill.

You can cut your cost of rubbish collection in the trouble areas of your city in half with the Dempster-Dumpster System! We know this because it is being done in dozens of other cities. This remarkable system comprises one or more truck-mounted Dempster-Dumpsters, each with only one man, the driver, which services scores of detachable Dempster-Dumpster Containers. Containers of various designs range in size up to 12 cu. yds. (two and one-half times the capacity of the average dump truck). The Dempster-Dumpster makes scheduled calls at housing, market and business areas, schools, hospitals, etc. Each pre-loaded container is picked up, hauled to disposal area, emptied and returned. Entire operation is handled hydraulically by means of controls in truck cab.

The Dempster-Dumpster System triples man-hour efficiency . . . reduces truck investment, gas, oil, maintenance costs . . . improves "housekeeping" methods . . . reduces fire hazards . . . provides an easier, quicker, safer and more effective manner of handling bulk trash and refuse.

The cleanliness of the Dempster-Dumpster System is due to the completely closed steel containers. Trash and refuse cannot be scattered over streets and alleys by winds or scavengers. In addition, Dempster-Dumpster Containers are rat-proof and fire-proof! For complete information write today! Manufactured exclusively by Dempster Brothers, Inc.

DEMPSTER BROTHERS, 8101 Dempster Building, Knoxville 17, Tenn.

Test stretch of street shows how Komac, new material, stands up much better than present materials used for patching. The left side of this patch, made entirely across the street, is the new Komac. The right side is the ordinary patching material used for many years. Both patches were laid down at the same time in winter. This picture, taken after four months of use by heavy traffic, shows the difference. The Komac is substantially intact while the other material has loosened and been deeply rutted by tires.

This New Street Material Permits Winter Street Repairs

The annual Springtime rash of broken automobile springs—and the Springtime rush of maintenance men to repair winter-damaged roads and streets that break them—may soon become things of the past.

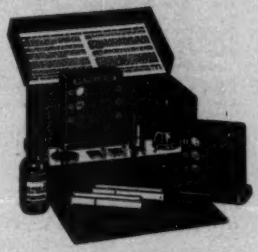
The reason: a new, long-lasting road material which, unlike present materials used for patching, may be applied in any kind of weather, can be stockpiled in readily usable form throughout the winter, and laid down without heating, using standard street repair equipment. Much of the street repair work now done in winter forms only temporary patches which must be replaced during the summer.

Fred C. Foy, vice-president and general manager of the Tar Products Division of the Koppers Co., Inc., Dept. 922T, Pittsburgh 19, Pa., announces that special binders for a new type of street material, to be known as Komac, are now being produced in limited quantities at the Koppers plants in Chicago, Ill., and Utica, N. Y., with additional facilities possible in time for 1952.

Mr. Foy reports that the new material is made by mixing special bituminous binders with aggregates to form a premix which has qualities long sought after for street construction and maintenance purposes. The resulting premix, pressed into chuck-holes of streets, makes a long-lasting patch.

E. O. Rhodes, special technical advisor to the Koppers Tar Products Division, states that the improved street repairing material is being made available after more than two years of testing, which included one of the most severe winters in a decade. Test streets were built and test patches installed during cold winter weather in Michigan, Wisconsin, Pennsylvania, New York, and Massachusetts. The special advantages of the material which he reports have been noted by contractors assisting in making the tests were: it is mixed cold in any type of mixing equipment; can be stock-piled during summer and fall at strategic places and removed easily from the stock-pile in any kind of weather; does not adhere to hauling or spreading equipment; need only be tamped or rolled into the holes in the pavement; can carry traffic immediately after it is rolled; does not "bleed" or push out of position in hot weather, and shows great resistance to skidding.

HELLIGE
SWIMMING POOL
TWIN-KIT



FOR ACCURATE pH AND CHLORINE OR BROMINE DETERMINATIONS . . .

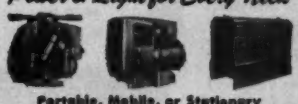
The Hellige Twin-Kit is the finest of the small testers on the market. It is equipped with the famous Hellige Glass Color Standards that never fade or change and carry a lifetime guarantee.

Write for Folder No. 800-F

HELLIGE
INCORPORATED
3718 NORTHERN BLVD. LONG ISLAND CITY 1, N.Y.

ONAN
Emergency Electric Plants
for Civil Defense

Power & Light for Every Need



Portable, Mobile, or Stationary
400 to 35,000 watts. A.C. or D.C. models.

No matter what happens to central station power during a bombing attack, electricity for essential defense needs is always available with Onan Electric Plants. Onan units, mounted on truck or trailer, or carried in the trunk of a car, can be rushed to any point where power and light are needed. Sturdy and dependable, Onan Electric Plants are an important link in a city's defense against disasters of any kind.

Write for folder

Onan PRODUCTS

D. W. ONAN & SONS INC.
7644 UNIVERSITY AVE. MINNEAPOLIS, MINN.

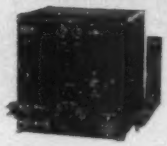
YOU CAN HAVE A DEPENDABLE CIVIL DEFENSE AND EMERGENCY COMMUNICATIONS NETWORK AT ONCE

You benefit immediately when you adopt the Sonar Plan for insuring workable 2-way radio communications. Existing facilities are integrated with necessary new equipment in a network that will serve faithfully in civil defense, police, fire, hospital, other municipal operations.

Most important, personnel to man your expanded network is assured, thanks to voluntary participation of organized radio amateurs in your municipality.

Sonar, long-time supplier to the radio amateur, has designed this new equipment for complete practicality. The new Sonar v.h.f. mobile MB-26 Transmitter can be operated by any authorized person. Tamperproof, it delivers a strong 6-watt broadcast using only the power normally required for your car's bright lights.

Equally simple is the new Sonar v.h.f. mobile SR-9 Receiver. More than a monitor or converter, it is a 9-tube superheterodyne receiver with over-all sensitivity better than .5 microvolt. Both units resist shock, fit anywhere—in moving vehicle or fixed station. If preparedness is important to you, ask about the Sonar Plan today.



ABOVE: new Sonar mobile MB-26 Transmitter. BELOW: new Sonar mobile SR-9 Receiver.

each **$72.45**

Write now for useful bulletins TAC-1 and RAC-1

SONAR RADIO CORPORATION

Headquarters for V. H. F. Communications Equipment

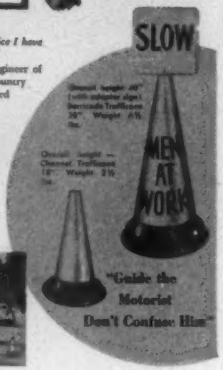
59 MYRTLE AVENUE • BROOKLYN 1, N. Y.

Trafficone SYSTEM of TRAFFIC CONTROL LEADS the NATION in Economy Efficiency Safety

say top traffic experts

"The Trafficone is the best engineered safety device I have seen in thirty years of traffic work . . ."

This statement was made by the Traffic Engineer of a large city. Severe tests throughout the country under the most critical conditions have proved *THIS IS A FACT*



SAFETY of RUBBER...AUTHORITY of STEEL

Trafficones are rapidly replacing old fashioned hazardous wooden and metal barricades and expensive flags and wire markers. Dangerous accident conditions to motorists and personnel injury problems with workers have been eliminated with this safe, yet effective control.

Interstate Rubber PRODUCTS CORPORATION

908 Avila • Los Angeles, California

YOU GET **PPD*** PIN POINT DETECTION

ONLY WITH

GOLDAK EQUIPMENT

The name GOLDAK on electronic instruments eliminates guesswork . . . it's your assurance of Pin Point Detection at all times, in any kind of weather. Throughout the world, with companies who need instruments that are accurate and durable, first choice is GOLDAK

MODEL L46 SENIOR LEAK DETECTOR

Detect costly leaks in water and low viscosity fuel lines, in their exact position. Completely portable, simple to operate. Latest electronic improvements and high quality parts, assures unequalled performance. Save time and labor, eliminate costly waste leakage with Goldak Model L46.

MODEL 620 BOX & VALVE LOCATOR

Pin Point Detection of Goldak's Model 620, saves you time and money, with immediate location of Buffalo Boxes, Valves, Covers and Buried Metals. Large areas surveyed in a few moments. Sharp, clear signals. Untiring operation, weighs only 8 lbs. Sturdily constructed, all-weather use. High quality parts assures maximum sensitivity, low operating and nominal replacement costs.

Write for FREE literature!

The GOLDAK Company

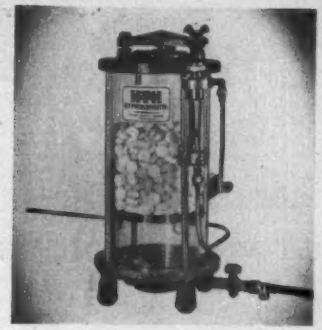
Leading Makers of PIPE LOCATORS

Since 1933

1544 W. GLENOAKS BLVD.

GLENDALE 1, CALIF.

New Chlorine Product-Equipment



A new method for chlorinating water has been developed by the Mathieson Chemical Corp., Mathieson Bldg., Baltimore 3, Md. This is a product-equipment combination that will apply chlorine, accurately metered, for those situations where a slow steady release of available chlorine is desired.

The combination will be particularly advantageous for the chlorination of small potable water supplies, industrial waste and sewage, cooling water (where algae control is a problem), for swimming pool water, and for many other applications where chlorination is necessary to industrial and public health.

The new product is Mathieson's well-known HTH (high-test calcium hypochlorite) in tablet form. The equipment is a specially engineered feeder called a hypochlorinator, designed to dissolve the tablets and dispense the resultant available chlorine solution at rates which can be accurately controlled and quickly varied to cover a wide range of operating demands.

HTH has been used for years to convey chlorine in dry form for various applications, but it has always been necessary to dissolve the granules in water and dispense the prepared solution through a feeding device.

According to the manufacturer, the new HTH-hypochlorinator combination will eliminate disposing insoluble sludge and clogging equipment, handling and storing bulky heavy glass bottles of sodium hypochlorite, and all weighing, mixing, and handling operations.

The hypochlorinator can be easily and quickly installed, presents no health or accident hazards, and does not require the attention of engineers or technical personnel as it is simple to operate. Its initial cost is less than alternate equipment, and maintenance and upkeep are negligible.

The tablets, pure compacted HTH containing 70% available chlorine with no binder or filler, and possessing excellent mechanical stability, are ¾ of an inch in diameter and ¼ of an inch thick, with slightly curved faces to facilitate handling. Each tablet weighs about 1/6 of an ounce, equivalent to about one teaspoonful of the granular HTH. They sell at approximately the same price as the granular HTH, and come packed in 100-pound non-returnable drums.

The hypochlorinator takes water from the high pressure point of a system at a rate controlled by a needle valve and indicated by a flow meter, and injects it into a tablet bed resulting in a chlorine solution, which is returned to the system at a low pressure point. Since the body of the unit is transparent plastic, the operator can tell at a glance when refilling is necessary.

Change in Corporate Name

The corporate name of the Southern Alkali Corp., was changed Sept. 1 to the Columbia-Southern Chemical Corp., Pittsburgh 13, Pa. A wholly owned subsidiary of the Pittsburgh Plate Glass Co., the firm is a producer of soda ash, chlorine, caustic soda, and related chemicals. Plants are located at Barberton, Ohio; Corpus Christi, Texas; Natrium, W. Va.; Lake Charles, La.; and Bartlett, Calif.

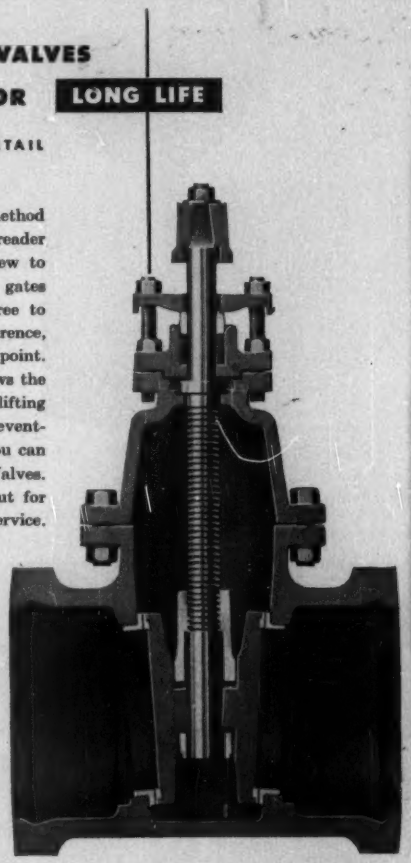
Clarence M. Brown, chairman of the board of directors for Pittsburgh Plate Glass Co., and the Columbia-Southern Chemical Corp., stated the action involves a change in name only.

R. D. WOOD GATE VALVES

DESIGNED FOR LONG LIFE

DOWN TO THE LAST DETAIL

Even a small point like the method of hanging the gates on the spreader has been studied with a view to eliminating undue wear. The gates or discs are hung *loosely*—free to rotate their complete circumference, preventing wear at any one point. The spreader design withdraws the discs from their seats before lifting them into the bonnet, thus preventing dragging of the faces. You can rely on R. D. Wood Gate Valves. They are designed throughout for generations of uninterrupted service.



BE EXTRA SAFE . . . OPERATE ALL VALVES AT LEAST ONCE A YEAR

Only three moving parts—spreader and two discs. In opening, gates rise clear of valve openings, provide unobstructed passage. Seasoned castings. Rigidly inspected. For working pressure up to 175 lbs. Tested to 300 lbs. Conforming to AWWA specifications. Supplied with bell, flanged or mechanical joint pipe connections.

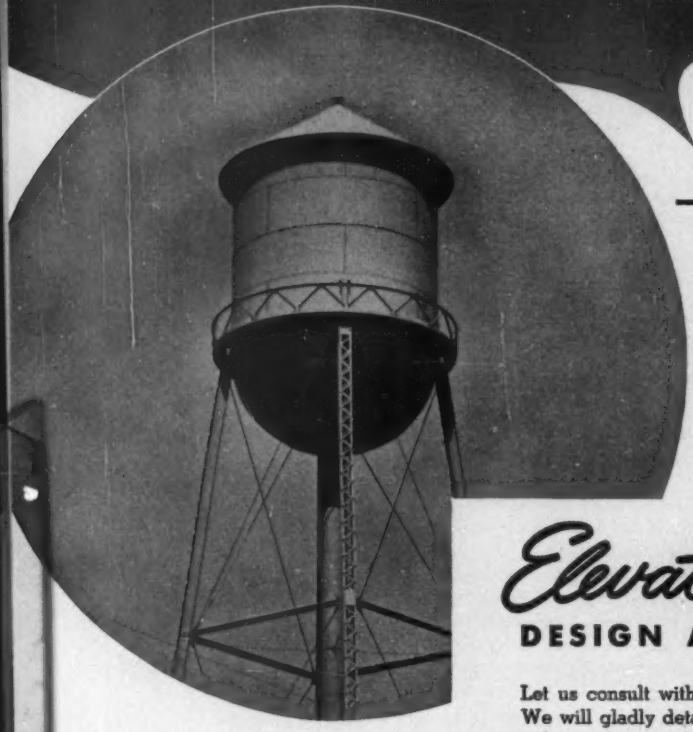
R. D. WOOD COMPANY

Public Ledger Building, Independence Square

Philadelphia 5, Pa.

Manufacturers of Mathews Hydrants and "Sand-Spun" Pipe (centrifugally cast in sand molds)

PITTSBURGH·DES MOINES



—to serve you on your water storage requirements—

OVER 50 YEARS OF EXPERIENCE IN

Elevated Steel Tank

DESIGN AND CONSTRUCTION

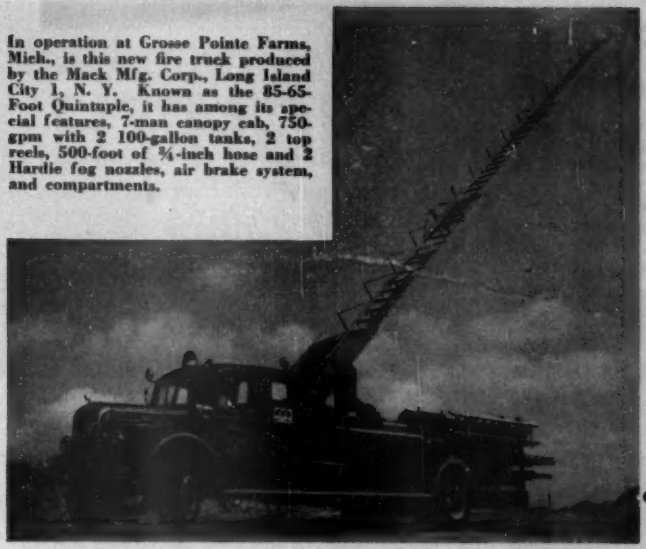
Let us consult with you on your elevated storage tank needs. We will gladly detail the features of our many tank types, and aid in selecting the right design and capacity to fit specific conditions. You can depend on P-DM craftsmanship in fabrication and erection—satisfaction is guaranteed! *Write for free 24-page brochure.*

PITTSBURGH·DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH (25)	3412 Neville Island	DES MOINES (8)	913 Tuttle Street
NEW YORK (7)	Room 915, 270 Broadway	DALLAS (1)	1217 Praetorian Bldg.
CHICAGO (3)	1216 First National Bank Bldg.	SEATTLE	920 Lane Street
	SANTA CLARA, CAL.	619 Alviso Road	



In operation at Grosse Pointe Farms, Mich., is this new fire truck produced by the Mack Mfg. Corp., Long Island City 1, N. Y. Known as the 85-65-Foot Quintuple, it has among its special features, 7-man canopy cab, 750-gpm with 2 100-gallon tanks, 2 top reels, 500-foot of ¾-inch hose and 2 Hardie fog nozzles, air brake system, and compartments.

Cathodic Protection For Coated Pipelines

While suitable coating materials reduce the corrosion of buried metallic structures, pitting can proceed rapidly at any flaws which may exist in the coatings. To secure the maximum economy, the coating should be supplemented with cathodic protection. This is inexpensive insurance against the ravages of corrosion.

Magnesium anodes usually offer the most economical source of current for the protection of such structures. In the customary anode installation for coated pipe, the design may vary from 1 anode per mile to groups of 3 or 4 anodes, with a spacing between groups of from 2 to 5 miles.

Dowell, Inc., Tulsa 3, Okla., cites that prior to the installation of Dowell magnesium anodes on a 12-inch bare Dresser-coupled line, 172 future corrosion leaks were thus prevented in 3½ years. The total cost of the anode installation was more than off-set by the maintenance savings resulting from the reduction in the rate of new leaks.

Water Works Salesman

having long-standing acquaintance with leading municipal and water works officials and consulting sanitary engineers in eastern territory, is available for manufacturer seeking an experienced sales representative in the municipal, water works, or sewage treatment field.
For further particulars, references, etc., please write

Box 349
c/o American City Magazine
470 Fourth Avenue
New York 16, N. Y.

American Vacuum Leaf Loader
Solves your leaf or clean-up problem

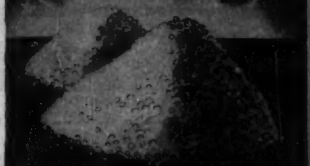
Write for leaflet
LEAF LOADER DIVISION
American Structural Steel and Tank Co.
21050 W. 8 MILE ROAD DETROIT 19, MICH.

Let's reflect a moment..

SAVE TIME & MONEY USING THE

Cataphote

BEADED SIGN KIT



Reflectorize and give extra life to your signs at ½ the usual cost. A brand new, extra low cost, easy-to-apply method of reflectorizing your signs. No special equipment, no special training. Virtually foolproof. Now you can reflectorize your own signs in your own shop. Write for full info and prices.

Cataphote
Corporation
TOLEDO 10, OHIO

Rush FREE descriptive pamphlet and full price list on CATAPHOTE Beaded Sign Kit and its low cost advantages to me:

Name_____
Title_____
City_____
State_____
MFRS. AGENTS INQUIRIES INVITED!

Eliminate the SMALL CHANGE PROBLEM!

The successful operation of a metered parking area is dependent on the availability of small change. Vendo* Coin Changers provide the missing link between the customer and the parking meter, resulting in increased patronage and greater revenue.

Vendo Coin Changers supply a constant source of nickels — 2 for a dime, 5 for a quarter.

- Completely Mechanical
- Easy to Operate—makes change fast
- Small and Compact—15½" tall by 11½" wide
- Dependable and Trouble-free

*REG. U. S. PAT. OFF.

THE VENDO COMPANY
7400 East 12th Street Kansas City 3, Missouri

AGENTS:

Good, exclusive territories are open for fast-selling "FERRO" signs. Every city needs these highly visible porcelain enamel signs.

"FERRO" signs are nationally known, tested, *proved*. Finest quality steel, deeply embossed, finished in brilliant, permanent porcelain enamel.

If you have allied lines and a following, write today for further information.

FERRO ENAMELING CO.
1100—57th Avenue Oakland 3, Calif.

PLANT BIG TREES NOW!

Move them quickly, easily with the "Rocker" Tree Mover

Handles 12-inch trees. Built-in jacks support truck. Power winch does the work.

Load "rocks" forward, balanced for hauling. Superstructure removable for other uses of truck.

This newly patented tree mover fits any standard truck chassis. Large size will move 5-ton loads with ease . . . smaller model has 3-ton capacity. Save time and labor costs . . . make hard jobs easy. You can load big trees on other trucks and trailers with this equipment, too, for long hauls or extensive plantings. Write today for details.

WILLIAMS & HARVEY NURSERIES
P. O. Box 7068, Country Club Station Kansas City 2, Mo.

PROTECT VALUABLE EQUIPMENT

from Sulphur Damage

Protect economies gained by sewage gas utilization with Connelly Iron Sponge. Eliminate risk of pitting and corrosion damage in engines and other valuable equipment due to presence of H_2S in your gas. Connelly Iron Sponge gas purification is the efficient, low-cost method that has been the choice of leading gas companies for over three-quarters of a century. Widely used in the sewage gas field too.

Take advantage of Connelly's years of experience in solving gas purification problems. Write today, a Connelly engineer is at your service.

CONNELLY, INC.
3154 S. California Ave., Chicago 8, Illinois
Elizabeth, New Jersey • Los Angeles, California

For Population Loadings from 500 to 5,000,000

Thousands of communities with P. F. T. Floating Cover Digesters enjoy safe carefree operation. P.F.T. Covers provide complete submergence of buoyant sewage solids, more effective and safe collection of sewage sludge gas and more complete digestion. Effective digestion control regardless of what loading or what portion of tank capacity is employed. Consult P. F. T. Engineers for complete data.

P.F.T. FLOATING DIGESTER COVERS

P.F.T. **PACIFIC FLUSH TANK CO.**
Waste Treatment Equipment Exclusively Since 1903
4241 RAVENSWOOD AVE. CHICAGO 13, ILLINOIS
NEW YORK • LOS ANGELES • SAN FRANCISCO • CHARLOTTE, N. C. • JACKSONVILLE • DENVER

Director of International Road Federation

Roy E. McCluskey, vice-president and general sales manager of R. G. LeTourneau, Inc., Peoria, Ill., has been elected to the board of directors of the International Road Federation. He also has been named secretary - treasurer of the board of directors of the Construction Industry Manufacturers' Association, and a member of the International Committee and the Budget and Finance Committee of CIMA.

R. E. McCluskey

The International Road Federation has been officially designated by the Economic Cooperation Administration as spokesman for the highway industry and associated manufacturers in connection with the foreign programs of the ECA. The four controlling bodies are the construction and equipment industry, and the rubber, automobile, and petroleum industries.

LeTourneau is a pioneer in the scraper-type of earth-moving equipment.

American Bitumuls and Asphalt Co. Now Nationwide

Formation of a nationwide company for the manufacture and sale of various types of paving asphalts and special asphalt products was announced by Charles W. Stewart, president of the American Bitumuls & Asphalt Co., 200 Bush Street, San Francisco, Calif., formerly known as the American Bitumuls Co.

American Bitumuls & Asphalt, which formerly operated only in the territory east of the Rocky Mountains, is acquiring the assets of the Stancal Asphalt & Bitumuls Co., which has operated in the West. Both are subsidiaries of the Standard Oil Co. of California.

The organization will have 14 district offices, including manufacturing plants and asphalt refineries in the United States and Puerto Rico. San Francisco is headquarters.

Other officers include vice-presidents L. G. Thompson, production and research; E. G. Lohmann, finance; N. H. Angell, western sales, and L. P. Street, eastern sales.

Mechanical Pipe Threading

The attention-commanding but back-breaking task of putting threads on pipe has no place in the Water Department of Owosso, Mich. Instead, the city uses a Port-O-Pony pipe-threading machine. This device, a product of the Threadezy Manufacturing Co., Corunna, Mich., has paid for itself several times, City Commissioner Walter Bennett states.

CITIES FROM COAST TO COAST

adopt identification necklaces of Bead Chain for students

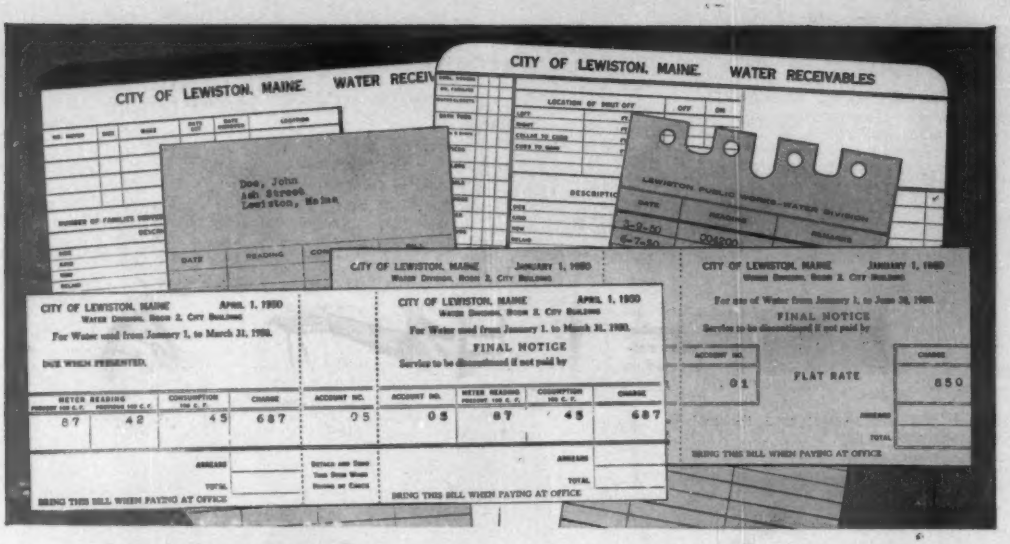
From New York City to Redwood, California, many cities across the country are ordering Identification Necklaces as a safeguard for their school children. Each student is being issued a necklace carrying a tag on which is stamped the student's identity and other information necessary for civilian defense.

For this purpose, Bead Chain has long been accepted as standard by our Armed Forces, for whom we have made identification necklaces for many years.

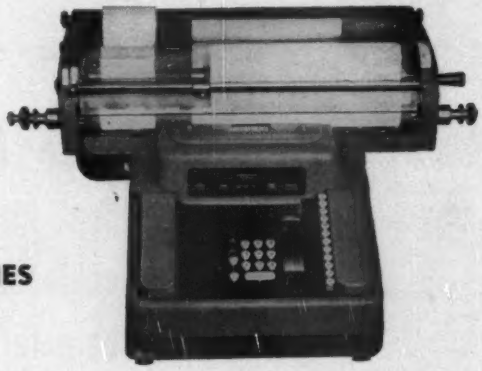
So flexible that it can't kink . . . economical, attractive, comfortable and very strong . . . Bead Chain is also preferred for religious chains and many other products made for personal wear. Write for catalog and complete information.

The BEAD CHAIN® Mfg. Co.

24 Mountain Grove St., Bridgeport, Conn.


CITY OF LEWISTON, MAINE. WATER RECEIVABLES
CITY OF LEWISTON, MAINE. WATER RECEIV
Doe, John
Lewiston, Maine
CITY OF LEWISTON, MAINE
APRIL 1, 1950
For Water used from January 1, to March 31, 1950.
DUE WHEN PRESENTED.
FINAL NOTICE
Service to be discontinued if not paid by
FLAT RATE
BRING THIS BILL WHEN PAYING AT OFFICE

A MODEL OF MUNICIPAL ACCOUNTING



Says —

JULIAN W. DESHAIES

Chief City Auditor

Lewiston, Me.

LOGICAL STEPS

1. When we decided to use the unit-ledger-card system and bill for water on penny post cards,
2. we further decided to do this work with the aid of an Underwood Sundstrand Accounting Machine.
3. With it, water bills are now produced at 225 per hour, a quarter of the former time.
4. Savings in salaries and printing amount to $8,000 a year.
5. Our selection of the Underwood Sundstrand machine was determined by its speed and simplicity. Aiding us in this decision was our 10 years' experience with Underwood Sundstrand Accounting Machines on budgetary control, and tax accounting and billing. We prepare budget reports in 20 minutes that used to take 2 or 3 days. We complete our tax work in 10 days where it formerly took 7 or 8 weeks. Now we bill water in 4 days against the previous time of 2½ to 3 weeks.

UNDERWOOD CORPORATION

Accounting Machines . . . Typewriters . . . Adding Machines . . . Ribbons, Carbon Papers and other Supplies

One Park Avenue — **New York 16, N. Y.**

Sales and Service Everywhere

Builders-Providence Personnel

Richard L. Lauderdale, sales engineer of Builders-Providence, Inc., 358 Harris Ave., Providence, R. I., has joined the engineering sales staff of Builders-Pacific, Inc., Berkeley, Calif. A member of the American Society of Civil Engineering, he has been specializing in Chlorinizer sales engineering.

Walter H. Brown has been transferred to the Projects Department of Builders-Providence, Inc., and will specialize in equipment applications for sewage and industrial waste treatment. Previously, he was a sales engineer in Builders' Standard and Engineered Products Department. Mr. Brown is

R. L. Lauderdale W. H. Brown

secretary-treasurer of the Providence Section, American Society of Mechanical Engineers, and a past president of the New England Sewage Works Association.

BRAXMAR BADGES

Standard Badges Since 1879

Write for circular illustrating badges for Police, Fire and other City, County and State Officials

John O. Voit, Pres.

C. G. Braxmar Co., Inc.
216 E. 45th St., New York 17, N. Y.

Job-to-plant radio contact speeds up road work.

"RCA 2-WAY RADIO saves us time and money on every job"

says Superintendent Harry Tuthill of Suffolk County Highway Department, Long Island, New York

Orders from headquarters flow out instantly to any job anywhere in Suffolk County . . . via RCA 2-way radio.

RCA "Fleetfone" is a compact, single-case transmitter-receiver. Single cable permits quick shifting from one vehicle to another.

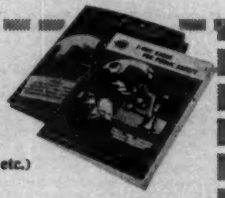
Cuts costs . . . keeps equipment rolling

Thirteen trucks and autos have instant 2-way contact with headquarters and each other. No more aimless driving. No more long delays from stalled equipment. RCA radio gets help to *where* it's needed *when* it's needed.

You, too, can profit from 2-Way Radio

Do *you* have a far-scattered communications problem? RCA 2-way radio can help you, as it has hundreds of operators of construction equipment, truck and bus lines, taxi fleets, public utilities, pipe lines, oil fields, and police and fire departments.

Compact "Fleetfone" fits into trunk or cab. Built to take abuse. Exceeds FCC standards. Easily maintained, uses ordinary radio tubes. Makes every truck or car a "phone station." Get full story. Mail coupon *today!*



RCA ENGINEERING PRODUCTS
Dept. 4V
Camden, N. J.

Please send me, without obligation, full story on how RCA 2-way radio can save me time and money in the application checked below.

☐ General Industry (Construction, utilities, logging, etc.)
☐ Public Safety (Highway Maintenance)

Name_____
Title_____
Firm_____
Address_____

RCA RADIO CORPORATION of AMERICA

DIFFERENT TYPES

For different traffic needs

The Steel Head
SUPERIOR
Supreme in strength; in resistance to damage and vandalism.

The Low Cost
HUSKY
Makes Karpark dependability available at a minimum investment.

The Versatile TWIN-O-MATIC
One installation times two cars; has every wanted feature.

The Adaptable UNIMATIC
Takes care of any parking situation—beautifully and efficiently.

The First Family of Parking Meters

KARPARK

A METER FOR EVERY PARKING NEED

Write for data to THE KARPARK CORPORATION CINCINNATI 6, OHIO

THE **MODERN** LAWN MOWER **SHARPENER**

CUTS MAINTENANCE COSTS

•

LOWER CAPITAL INVESTMENT

•

Economically and Quickly Sharpens All Municipal Mowers

Priced **$241.50** (less motor)

Sharpens All Reel Type Mowers • Hand, Power or Gang • 10 to 20 Minutes • No Dismantling No Extra Attachments Needed

All reel type mowers, from 5-inch edgers to 36 inch power mowers, are quickly sharpened to extreme ends of both left and right twist reel blades. Handle, wheels, roller and motor repair in place when sharpening is in process. Bed knife is sharpened in same brackets that hold mower in grinding position. No extra attachments required. One lever puts mower or bed knife in grinding position. 100% steel construction. Grinding head rides on five ball bearing races. Small, compact, easy to operate. Sharpens wood chisels, joiner knives and planer blades without extra attachments. State Sharpener Attachments available.

1/3-hp. G.E. 60-cycle Motors now available—$21.50 extra.

Send for Free Bulletin No. 258

ORDER NOW • IMMEDIATE DELIVERY

MODERN MFG. CO.
160 N. FAIR OAKS AVE. • PASADENA 1, CALIF.

Specify

WARREN CAST IRON PIPE!

•

In all sizes from 2" to 84" with all types of joints . . . and WARREN special castings to meet your requirements for non-standard patterns.

Warren FOUNDRY & PIPE CORP

ROADMASTER
Street Sweeper

WIRE

High Scleroscope Rating
Uniform temper.

Specially processed for high fatigue — against breakage. Long wearing. Conveniently cut and delivered in 100 and 200 lb. boxes. Prompt shipment from stock of all standard sizes.

This gutter broom wire will prove an economy in your service.

"MORE MILES PER BRUSH"

JOHNSON
Steel & Wire Co., Inc.
Worcester 1, Massachusetts
New York Akron Chicago Detroit
Los Angeles Toronto

Gamewell's Vice-President And General Manager

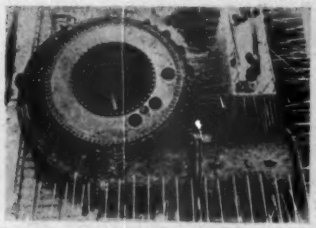
Ward Grantham has been elected vice-president and general manager of The Gamewell Co., manufacturer of fire alarm and police signal systems, of Newton Upper Falls 64, Mass.

Ward Grantham

He had previously been associated with the Westinghouse Electric Corp., P. R. Mallory & Co., Inc., the Nathan Manufacturing Co., and Jerome Barnum Associates.

Worthington Pumps Assist In Moving Water 500 Miles

California's $600,000,000 Central Valley Project of water transference for irrigation began integrated operation on Aug. 1st after 14 years of construction work. According to the Federal Bureau of Reclamation, this project of transferring surplus water from the Sacramento River Valley to the thirsty San Joaquin River Valley (a distance of 500 miles) will be the "longest mass movement of water ever attempted by man."



Construction view of one of the big centrifugal pumps being placed at the Tracy project.

The Worthington Pump and Machinery Corp., Harrison, N. J., reports that on Aug. 1st, 6 Worthington centrifugal pumps of 22,500 hp each began giving 2,000 gallons per minute a 200-foot lift from the Sacramento River, at Tracy, Calif., sending it into the 120-mile Delta Mendota Canal to irrigate farms in the San Joaquin Valley.

Each pump is rated at 767 cubic feet per second at a 200-foot pumping head. The completed plant will be able to pump nearly three billion gallons every 24 hours. In 30 minutes the 6 pumps, driven by 135,000 hp, will handle more water than the City of Sacramento uses during an average day.

To house these pumps, the world's second largest pumping plant has been constructed at Tracy in an excavation larger than Hoover Dam. The project was started in October 1947.

Revere ELECTRIC MFG. CO. CHICAGO, ILL.

LIGHTING For Every Municipal Need

New Creations in single and double arm one-piece Steel Standards to conform to the latest E.E.I. and I.E.S. practices. Also Luminaires for Incandescent or Mercury lamps. Write for data.

We manufacture
A COMPLETE LINE of LIGHTING EQUIPMENT
for STREETS, AIRPORTS, SPORTS, PLAYGROUNDS, PUBLIC BUILDINGS, BRIDGES, TUNNELS, VIADUCTS, ETC.

See us before making any commitments

HINGED POLES ELIMINATE CLIMBING

HINGED POLES for STREET LIGHTING

ELIMINATE ELEVATORS
One-man servicing job — Here's the Standard in lowered position. Chain is removed when Standard is raised. Retaining nut is secured by padlock.

PROTECT VULNERABLE AREAS with REVERE LIGHTING

No. 3801 Revere Elliptor 300 to 1500 Watt open-type flood.

180° Fresnel Flood for fence and boundary lighting.

18 and 20 inch Incandescent Searchlights

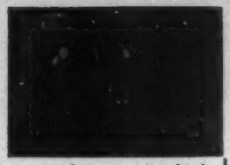
No. 4200 Weatherproof 750-1000-1500 Watt Enclosed Flood for long range lighting.

No. 3818 Area Light Excellent for gates, fences, yards, etc.

REVERE ELECTRIC MFG. CO.

6015 BROADWAY — *Indoor and Outdoor Lighting Equipment for Every Need* — CHICAGO 40, ILL.

DARKNESS IS DANGER



Patrolman fills in accident report on one of two cars involved in collision. Minutes later, patrolman (under blanket) was struck by a third car and seriously injured.

Protect Your Men and Equipment with Red Warning Flares

Red Flares are unmistakable warning signals. Available in three sizes—15, 20 or 30 minute. Self-contained friction cap provides instant ignition. Brilliant red flame is not affected by wind, rain or snow.

Contact your equipment dealer or write:

SIGNAL FLARE DIVISION
STANDARD RAILWAY FUSEE CORP.
P. O. Box 30-A **Needham Heights 94, Mass.**

GRAVELY blows Snow Troubles away!

Solve your snow removal problems with the new Gravely Snowblower! Clears walks, drives, hard-to-get-to-places quickly and economically.

Powerful 5 HP Gravely does 20 year-round maintenance jobs faster, better, easier—20 tools to choose from—all powered by the same rugged, dependable tractor.

All gear drive, power reverse, city tested for 30 years!

Ask for your copy of "How To Solve Snow Removal Problems". Write for it today!

Gravely Motor Plow & Cultivator Co.
BOX 1073 **DUNBAR, WEST VIRGINIA**

Stewart PRODUCTS — FOR PUBLIC PROPERTY

FENCE

Chain Link Wire or Iron in many styles, weights and heights

SETTEES
WIRE MESH PARTITIONS
IRON RAILINGS
STEEL FOLDING GATES
ORNAMENTAL IRON LANTERNS
GRILLES • BRONZE PLAQUES
STEEL FLAGPOLES

Whatever you need, if it's made of iron, wire or bronze, it will pay you to contact Stewart. Literature sent on request. Please mention products in which you are especially interested.

Stewart IRON and WIRE FENCES

THE STEWART IRON WORKS CO., INC.
Stanley M. Stewart, Pres.
1821 Stewart Block
Cincinnati 1, Ohio

EXPERTS IN METAL FABRICATIONS SINCE 1886

Aeroil WINTER CONSTRUCTION HEATERS

KEEP WINTER JOBS RUNNING AT SUMMER SPEED

- Concrete Heaters
- Thawing Torches
- Steam Plants
- Salamanders
- Ground Thawers
- Portable Coil Water Heaters

AEROIL PRODUCTS CO., INC.
5 Wesley Street — South Hackensack, N. J.
Also Chicago, San Francisco, Dallas, Seattle, Pittsburgh, Dedham (Mass.), Jacksonville, Los Angeles, Forty Fort, Pa.

LEADITE

FOR JOINTING CAST-IRON WATER MAINS

Melted and Poured ***No Large Bell-holes to Dig***
Saves at Least 75%

Leadite is shipped in powder form, packed in sacks of 100 lbs. net each. Leadite tested and used for over 50 years • Leadite joints improve with age.

Be sure it is Leadite and accept no imitations

THE LEADITE COMPANY
Girard Trust Co., Bldg., Philadelphia 2, Pa.

Two of the new "Santa Claus Lane" signs, which lined up along a parkway, two to a block, create a five-block long "Santa Claus Lane" that is brilliantly reflective in full color at night.

Posters Available for A Santa Claus Lane

After spending $21,000 for Christmas decorations in 20 years, McCook, Nebr., population 7,642, installed reflectorized signs forming a "Santa Claus Lane." Initiated in 1948, there are now 46 signs extending on both sides of 10 city blocks.

The idea has been developed by Minnesota Mining & Mfg. Co., Saint Paul 6, Minn., for distribution through sign shops on 30 days' delivery. There are 10 posters 4 by 8 to 8 by 8 feet that depict the Nativity story, the "Night Before Christmas," toyland, and season's greetings for erection along five city blocks as a special "Santa Claus Lane." The posters, of 24-gage sheet steel, are covered with 'Scotchlite" reflective sheeting.

Determines Asphalt Content In Streets Quickly

Probably the quickest test known and accepted today that tells how much asphalt is in an existing alphaltic concrete pavement is the one that uses the Braun Dulin Rotarex separator. This machine is available in a 500-gram hand-driven unit, a 1,000-gram, motor-driven unit, or a 1,000-gram exposion-proof motor-driven machine.

The separator enables a city official to take a sample of existing pavement in use for several years and see how much asphalt still is in it. With this information, he can more intelligently plan his resurfacing program. It also will tell how much asphalt is in new mixes and thereby give confirming evidence that the amount of asphalt called for in the design actually is being used.

The company also manufactures the Braun Porter sieve shaker which will quickly give detailed sieve analyses of sands, coarse aggregates, or soils. The concern also produces soil augers and soil sampling tubes for soil tests in connection with street, airport, or other work.

Bulletins on this equipment can be obtained from the Braun Corp., 2260 E. 15th St., Los Angeles 21, Calif.

Separator, available in a 500-gram hand-driven unit, 1,000-gram, motor-driven unit, or a 1,000-gram explosion-proof motor-driven machine.

BIG OR SMALL— INDOORS OR OUT...

Type PB Pumps in service handling engine jacket cooling water.

Type PB Pumps providing water supply to pressure system.

PEERLESS PUMPS

YOU CAN SAVE ON COST & SERVICE WITH PEERLESS *FLUIDYNE* PUMPS

7 REASONS WHY PEERLESS END SUCTION PUMPS OUTPERFORM IN GENERAL PURPOSE APPLICATIONS

1. They're ECONOMICAL. Designed for economy in first cost, installation, maintenance and operation.
2. They're DURABLE. Every consideration has been given in design and construction to assure long service life.
3. They're EFFICIENT. All sizes, types reveal high performance ratings.
4. They're VERSATILE. Indoors or out, every general utility pumping service can use Fluidyne Pumps.
5. They're COMPACT. They fit neatly into both piping and pumping layouts.
6. They're EASILY MAINTAINED. No special tools are required to perform ordinary pump maintenance.
7. COMPLETE LINE. One of the broadest offered. Drives: electric, belt or flexible coupled; Hp range: from ¼ to 150 hp; Capacities: up to 5500 gpm; Heads: up to 260 feet.

Integral HP V-Belt drive Type PB Fluidyne Pump.

Integral HP Close Coupled Electric Type PE Fluidyne Pump.

Write for descriptive bulletin today.

CLIP AND MAIL COUPON TODAY

Peerless Pump Division,
Food Machinery and Chemical Corporation
301 West Avenue 26, Los Angeles 31, Calif.

Please send without obligation new Bulletin B-2300 describing Fluidyne line of fractional and integral hp pumps.

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____

IT'S NEW!

IT'S DISSTON!

IT'S THE BEST IN LIGHT-WEIGHT SAWS!

Here is a new model of an old woods favorite—the tough, light-weight DO-101 Disston One-Man Chain Saw. It has a sturdier crankshaft, a reinforced rear handle, new rapid-action toggle stop-switch and many other advanced features for harder use and longer life. And, for smoother, faster cutting, the DO-101 is equipped with Disston's new fast-cutting "DF" chain. Running on a narrow profile slotted guide rail, this chain cuts a kerf that minimizes binding. Can be sharpened by hand on the rail in a matter of minutes.

Don't take our word that a Disston is just about the finest cutting tool that's ever come your way. Ask anyone who has ever handled a Disston. Then see your Disston Dealer. He'll let you try out one of these beauties for yourself. Once you feel that steady power safely under your command and effortlessly guide the chain through a cut, you won't rest until you own one of these time-saving money-makers yourself.

Don't forget, Disston also makes the powerful DH-120 12-hp Two-Man Extra Duty Chain Saw . . . a favorite the world over.

Featuring—

New, Fast-Cutting Chain

Narrow Slotted Guide Rail

FIGHT WASTE

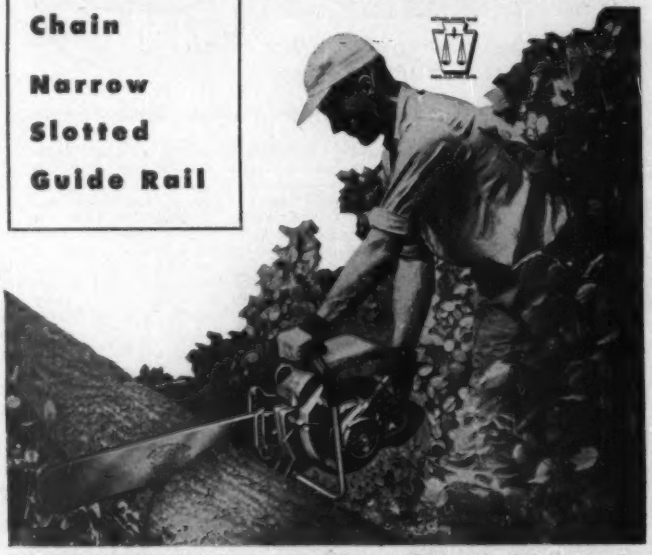
A tip for present Disston Saw Owners . . .

Follow the simple FIGHT WASTE preventive maintenance instructions which are available to you free of charge. Send for the valuable check-up charts, the illustrated maintenance folder, the detailed handbooks. Above all, rely on the services of your Disston Dealer.

HENRY DISSTON & SONS, INC.

J-11 TACONY, PHILADELPHIA 35, PA., U.S.A.

In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.



THE DO-101 ONE-MAN SAW. 2-cycle, single-cylinder engine. Positive action clutch. Instant-starting, self-rewinding Magnapull Starter. Automatic chain lubricator. Fast-cutting "DF" chain and slotted profile guide rail in 20", 26", 32", 36", 40" lengths. Also available are 18" and 24" rails with straddle type chain and 15" bow saw for speedy bucking and limbing. Helper handle available for two-man operation.

Factory Manager For Buffalo Meter

The appointment of Jens Duus as factory manager, has been announced by the Buffalo Meter Co., 2902 Main St., Buffalo 14, N. Y., following the resignation of Walter Boals, former factory manager, due to ill health.

Jens Duus

From 1925 to 1941, Mr. Duus was factory manager of the Phoenix Meter Co., until it was purchased by the Rockwell Mfg. Co., when he went to Brooklyn as factory superintendent of Rockwell's National Meter Division. After the manufacture of Arctic and Tropic meters was moved from Pittsburgh to the National plant, he continued as plant superintendent of the combined manufacturing unit, until his resignation earlier this year.

The Buffalo Meter Co. produces American and Niagara water meters, as well as a variety of meters for industrial measurements of liquids, including oils, hot water, syrups, solvents, and many chemicals.

Although the company is 59 years old, Mr. Duus is only the third man to head factory operations.

YOUR BEST BUY

NEW PATHFINDER PIPE LOCATOR

★ POWERFUL PRECISION UNIT
★ ECONOMICALLY PRICED
★ LIBERAL TRADE-IN PLAN
★ BRILLIANT SAFETY PAINT
★ LIFE TIME GUARANTEE

Only PATHFINDER offers all vital features you want . . . combined in one handy, compact unit. Quickly, accurately it locates position and depth of pipes, tees, valves, buried tools. The liberal trade-in plan gives you an added opportunity to save. Get the facts and you'll buy PATHFINDER!

Write! State model and year of locator to be traded.

PATHFINDER COMPANY

1726 Beverly Drive • Pasadena 7, California

San Francisco headquarters for sales and service activities of the De Laval Steam Turbine Co.

De Laval Announces New Headquarters on West Coast

The De Laval Steam Turbine Co., Trenton 2, N. J., announces the completion of a new building at 160 Folsom St., San Francisco, Calif.

The expanded activity will be under the direction of C. F. Reeves, who has been in charge of De Laval's West Coast sales.

The building will be the company's new San Francisco headquarters for sales and service activities. Besides providing increased warehousing facilities for standard centrifugal pumps, IMO pumps, speed reducers, and flexible couplings, it will also permit much faster handling of repair and service orders for De Laval's western customers.

Link Radio Has New Chief Engineer

James B. Ferguson is the newly appointed chief engineer of the Link Radio Corp., 125 W. 17th St., New York 11, N. Y., designer and manufacturer of electronic communications equipment since 1932.

J. B. Ferguson

He joined the company as a consulting engineer in June 1950, and designed the new Link mobile radio transmitter-receiver units, such as the Link Expediter for adjacent channel operation.

Staff appointments made by Mr. Ferguson include: Frederick A. Schaner, assistant chief engineer in charge of governmental development; Harold M. Heimark, assistant chief engineer in charge of commercial development, and J. W. Campbell, assistant chief engineer in charge of engineering coordination and services.

Your Standard Roadside Warning Signs Instantly

100% Activated

with Winko-Matic

alternate-flasher signal

Proven BEST by Obedience Test

ACTIVATION means greater safety. Self-contained, alternating flashers, visible at least a mile, command driver's obedience to the message on your sign . . . day or night . . . in fog, snow, rain. Operates on 110 V. or any desired current. Red lenses for stop signs; amber for all others.

For complete details on activating your own signs, easy installation, minimum maintenance,

Write for Bulletin No. 101

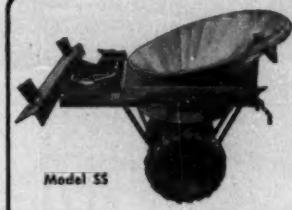
Winko-Matic Signal Co.

750 Broadway Lorain, Ohio

FLINK SPREADERS

So Good Uncle Sam Wants First Call . . . .

Yet Immediate Orders Can Still Be Filled



Model SS

New improved pull type Spreader for sand, cinders and all other granular materials used for ice or dust control and sealcoating. Large hopper for easier charging. The demand for Model SS Spreaders for military airport use has limited the civilian availability; however, we will continue to fill orders as received as long as material holds out.

Thousands of Flink "Power-matic" hydraulic drive, tail gate spreaders are currently in use for ice control, dust control and road building and maintenance. Does not limit the use of the truck for spreading alone. Cab control. Write for literature and name of distributor near you.

THE Flink CO. STREATOR ILLINOIS

Department 600

LINDSAY MODEL T-33 AIR COMPRESSOR

Water Departments, Municipalities and Contractors choose this powerful low cost compressor for opening service trenches and other jobs for which light paving breakers and rock drills are used. Write for detailed information. Dealerships are available in some areas.

P. K. LINDSAY COMPANY

97C Tileston St. Everett 49, Mass.

Readily adaptable to installation in "batteries," American Approved heavy-duty bicycle racks are built to last a lifetime.

Bicycle Racks for Safety

"If you are among those who think that the bicycle in the United States is on its way out, you're due for a rude shock," declares Norman R. Miller, vice-president of the American Playground Device Co., Anderson, Ind. He reports that "actually, more bicycles are sold today than ever before, and they are being ridden by both children and adults."

Mr. Miller announces that to decrease the hazard and public liability of bicycles lying about parks and playgrounds, the American Playground Device Co., manufactures racks to accommodate 22, 23, 44, and 66 bicycles, and that any combination of these units may be used.

American heavy-duty bicycle racks are of all-steel construction and hot-dip galvanized for lasting rust protection, designed for installation according to the buyer's exact requirements. They are available either in the portable style or for permanent setting in concrete.

"Whichever kind one uses," Mr. Miller declares, "he will be pleased to notice how well new bicycle racks are accepted by the cycling public, and how much they contribute to the tidiness, attractiveness, and safety of public property."

Quick action Spreading with . . .

WAUSAU SPREADERS

(TRAILER TYPE)

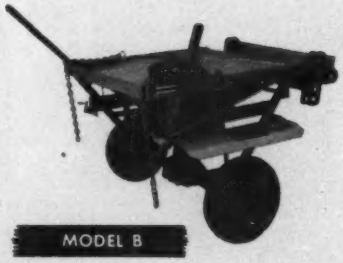
DESIGNED, ENGINEERED AND BUILT BY THE WORLD'S LEADING SNOW PLOW MANUFACTURER

Positive control of Thickness
Positive control of Width
Positive control of Direction
No hazards to passing vehicles
Low Cost self contained unit

Attached or disconnected in a minute
Model A Operator platform "Safety Built"
Long life construction — Sturdily built
Spreads Materials from 8 to 20 Feet.

MODEL A

Spreads materials equally well forward or reverse . . . ideal unit for ice control or seal coating.



MODEL B

Features of construction and simplicity of design warrant your investigation NOW of Wausau Spreaders . . . there are two models to meet your budget.

Write for details

WAUSAU IRON WORKS

Pioneer Snow Plow Builders

WAUSAU, WISCONSIN

Sold and Serviced By Leading Equipment Distributors

Water-Works Public Relations Film Prepared By General Electric

A visual program designed to enlist support of community water-works projects is announced by the General Electric Co., Schenectady 5, N. Y.

It represents the latest in the company's "More Power to America" series, and features a 25-minute, full-color, sound motion picture, "Pipeline to the Clouds."

The 16-mm film outlines the need for immediate action to combat potential shortages and to assure safe, adequate supplies. The motion picture was produced by a Hollywood studio with the technical assistance of the American Water Works Association and the United States Public Health Service.

Other important elements of the program are a 40-page manual, "Good Water—And Plenty of It," and a four-page audience hand-out entitled, "Wonders of Water." Program kits, containing a print of the film, five copies of the manual, and 200 pamphlets, are available at the reproduction cost of $170 to industrial and civic organizations wishing to conduct campaigns to improve local water supply conditions.

A Correction

In the September issue of THE AMERICAN CITY, a caption accompanying a photograph on page 220 reported V. H. Blackinton & Co., Inc., as being located in Newton Falls, Mass. However, the company's correct address should have been listed as Attleboro Falls, Mass. The editors deeply regret this error.

Portable Steel Bleachers

Portable steel bleacher, which can be towed, carried, or demounted into small units.

A new type of portable steel bleacher that can be towed, carried, or demounted into small units, is being manufactured by Seating, Inc., 3565 Wooddale Ave., Minneapolis, 16, Minn., under the brand name of Sico.

Sections are 12-feet long 5 rows high, and weigh 789 pounds with planks, 325½ pounds without planks. Eight spectators may be seated per row (40 per section), allowing 18-inch seating room for each.

According to the manufacturer, no alterations are necessary when adding linear or vertical sections. A special design principle of Sico bleachers—called the "4th man feature" permits every fourth spectator to be seated at the cost of the first three plus additional seat and footboards.

Nels P. Nelson Dies

The N. P. Nelson Iron Works, Inc., 820 Bloomfield Ave., Clifton, N. J., announces the death of its founder and president, Nels P. Nelson on Aug. 29.

Florida Representative For U. S. Pipe & Foundry

The United States Pipe & Foundry Co., Burlington, N. J., with its Southern District sales office in Birmingham, Ala., announces the appointment of Junius Walthall as its resident representative for the State of Florida. He will make his headquarters at 1040 Sedeeva St., Clearwater, Fla.

Use "GUNITE," For durability and economy

FOR REPAIRING: Reservoirs, Dams, Filter Plants, Sewage Disposal Plants, Tanks, Stadiums, Bridges, Sea Walls, Breakwaters.

FOR LINING: Reservoirs, Swimming Pools, Tunnels, Sewers, Pipe, Concrete, Brick and Steel Tanks, Stacks, Bunkers, Irrigation Ditches

FOR CONSTRUCTING: Prestressed Tanks, Stacks, Piles, Side Walls and Roofs, Steel Encasements.

The proper maintenance and repair of structures is more important now than ever before.

Write for 48-page illustrated booklet showing "GUNITE" at work.

Nationwide operation Experienced Personnel

PRESSURE CONCRETE COMPANY

NEWARK 5, N. J. 193 Emmet Street
CHARLOTTE, N. C., Liberty Life Bldg.
CHICAGO, ILL. 33 No. La Salle Street
FLORENCE, ALA., South Court Street

REPLACE troublesome VALVES With . . .

EDDY MECHANICAL JOINT GATE VALVES

Old and troublesome valves . . . or too few valves in a distribution system . . . can be responsible for dangerous and costly slow-down or shut-down of water supply for every day use or, more serious, when badly needed in event of an emergency. Now is the time to make replacements and to install new valves where conditions show the need for so doing. The Eddy Valve, bronze mounted throughout, with mechanical joint connections (only a ratchet wrench needed) is best for easy installation . . . for easy operation . . . for long life trouble-free service.

Write today for prices and delivery date for valves needed to modernize your water distribution system.

EDDY VALVE COMPANY
A Subsidiary of James B. Clow & Sons
WATERFORD, NEW YORK

Surfa-slick SELF-HEATING ASPHALT SMOOTHING IRON

Patent Applied for

Municipalities! This lightweight, rugged, simple, time and money saving smoothing iron will pay for itself in a few days' use.

No more building and feeding fires on your asphalt jobs!

HOT IN TEN MINUTES
HOT ALL DAY LONG

- RUGGED
- SIMPLE
- SAFE
- ECONOMICAL
- LABOR SAVING
- COMPACT

Dealer inquiries requested

J. E. WOODS MFG. CO.
1516 First St., San Fernando, Cal.

Surface heater, which covers 108 square feet and generates heat at 2300° F.

Faster-Operating Surface Heater

When asphalt streets get out of hand, many feel that the Asphalt Highway Surface Heater is the machine to bring them back.

They get out of hand for several reasons. On a street with little traffic, the surface may crack and rot away. On other streets, the traffic may form ruts and waves. Street maintenance men know that by being able to remove the resurface of a street without disturbing the established traffic packed base, that a more stable and longer lasting result will be achieved.

The Asphalt Highway Surface Heater was developed by C. N. Sowell, 1055 Victory Place, Burbank, Calif. His ideas on what should go into the heater came about from his experience in charge of a Los Angeles City surface-heating crew.

This heater is said to be the largest heater for sale on the market today. It can cover 108 square feet of area instead of the conventional 54. It works faster, generating heat at 2300°F instead of 1200°F, thus needing to remain stationary for two minutes to heat a 2-inch depth instead of 10 minutes. The Model 03 Asphalt Highway Surface Heater is capable of cuts to more than 1-inch on regular hard AC pavement in one continuous forward operation. The reason for such a tremendous penetration is that the depth to be removed is designated by the forward speed of the heater and the distance that the tractor is kept behind the heater. The hood can move 20 inches to either side. Thus, the heater can work adjacent to street-car tracks and allow a street-car to pass. The flexibility also enables the machine to operate as a weed burner, fill drying, melting ice, heating a ballast for penetation coat, popping concrete, and grooving and heating pavement, surfaces, and adding chips while still soft.

The efficiency of the unit can be demonstrated by operating results that the manufacturer has obtained. On one stretch of pavement, this heater required only 250 gallons of fuel oil, one operator, and one day. On a similar stretch, the old-style heater required 1,800 gallons of fuel, an operator, and a helper, and 3 days to do the work.

Pitt Chem Protective Coatings guard your equipment with a tough, surface-protecting film . . . an impervious sheath against strong chemicals, high temperatures, atmospheric exposure and other destructive elements of industrial corrosion and contamination. *Pitt Chem* Coatings are completely uniform and dependable because they are laboratory-controlled from raw materials to finished product. You'll find the cost of safeguarding your equipment with *Pitt Chem* is surprisingly low. ● For more information, write for new booklet, "Control Corrosion Through Pitt Chem Protective Coatings."

★ Hot Applied Tar Base Coatings
★ Cold Applied Tar Base Coatings
★ Alkyd Base Coatings
★ Chlorinated Rubber Base Coatings
★ Vinyl Base Coatings
★ Phenolic Base Coatings

Protective Coatings Division
PITTSBURGH
COKE & CHEMICAL CO.
GRANT BUILDING • PITTSBURGH 19, PA.

W&D 3726

COKE • CEMENT • PIG IRON • COAL CHEMICALS • ACTIVATED CARBON • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS

Joins Consulting Engineers

The consulting engineering firm of A. C. Kirkwood & Associates, Wirthman Bldg., Kansas City 3, Mo., announces that Thomas C. Kirkwood is now a member of the firm. Founded in 1947 by A. C. Kirkwood, the organization has served as engineers and consultants for public and private clients in reports and design work with steam and diesel power plants, sewage-treatment plants, water works, and other projects.

T. C. Kirkwood

T. C. Kirkwood holds membership in several engineering societies. A. C. Kirkwood was actively engaged for 23 years as a consulting engineer before organizing his own firm. A member of various engineering organizations, among which is the American Water Works Association, he is active in civic affairs and serves as a contributing editor to "Heating, Piping and Air Conditioning."

The American City Professional Service Directory

ACKLEY, BRADLEY & DAY
Architects—Engineers—Specialists for 25 years
Swimming Pools, Ice Rinks, Recreation Parks, New Designs, Surveys, Plans and Supervision.
Old Pools Modernized
Correspondence Invited
200 Chestnut Street — Swarthmore, Pa.

ALBRIGHT & FRIEL, INC.
Consulting Engineers
Water, Sewage and Industrial Waste Problems. Airfields. Refuse Incinerators & Power Plants. Industrial Building. City Planning. Laboratory. Reports, Valuations.
121 South Broad St. — Philadelphia 7

ALLEN & HOSHALL
Consulting Engineers
Mechanical—Civil—Electrical
Municipal Improvements
65 McCall Plaza
MEMPHIS, TENNESSEE

ALVORD, BURDICK & HOWSON
Chas. B. Burdick
Louis R. Howson Donald H. Maxwell
Water Works — Sewage Disposal
Water Purification — Drainage
Flood Relief — Appraisals
Sewerage — Power Generation
Civic Opera Bldg. — Chicago 6, Ill.

ABRAMS AERIAL SURVEY CORPORATION, Lansing, Michigan
One-quarter Century of Experience
Planimetric and topographic maps, controlled mosaics,
Stereograms, relief models, large-scale atlas sheets.
The complete job—photography—compilation—to finished survey.
Oblique photographs for pictorial views—for project presentation.
AERIAL SURVEYS — OBLIQUE PHOTOGRAPHY

The American Public Utilities Bureau
Organized to assist municipalities and public groups in utility valuations, rates, franchises, accounting and surveys.
John Bauer, Ph.D., Director
280 Broadway, New York City 7

The **AMERICAN APPRAISAL** *Company*
Milwaukee 2, Wis. • New York • Chicago • and other Principal Cities
Appraisals of Municipal Properties: Schools, Utilities, Hospitals, City and County Administrative Buildings For Insurance and Accounting Purposes

E. T. ARCHER & COMPANY
E. T. Archer — E. E. Hagan
Consulting Engineers
Organized 1907
Reports — Designs — Supervision —
Water Works — Sewer Disposal —
Power Systems
Railway Exchange Bldg.,
Kansas City 6, Mo.

B & B ENGINEERING CORPORATION
Fire Alarm and Traffic Signal — Engineers and Consultants
P. O. Box 31 — Norwood, La.
Branches: New York, N. Y. — Baton Rouge, La. — St. Louis, Mo.

ASSOCIATED CONSULTANTS
Consulting in Street Traffic and Transportation
GEORGE W. BARTON
Engineering Director
1704 Judson Ave., Evanston, Ill.

BLACK & VEATCH
Consulting Engineers
Sewerage, Sewage Disposal, Water Supply, Water Purification, Electric Lighting, Power Plants, Valuations, Special Investigations, and Reports.
4706 Broadway — Kansas City 2, Missouri

JOHN J. BAFFA
Consulting Engineers
Drainage, Sewerage, Sewage and Wastes Treatment
Water Supply and Water Purification
Investigations — Sanitary Planning
Reports — Plans and Specifications
75 West St. — New York 6, N. Y.

D. L. BRIEGEL AND ASSOCIATES
Consulting Engineers
PARKING STRUCTURES — GRADE SEPARATIONS — POWER PLANTS
BRIDGES — EXPRESSWAYS — AIRPORTS
SURVEYS • REPORTS • DESIGN • CONSTRUCTION SUPERVISION
2631 WOODWARD AVENUE — DETROIT 1, MICHIGAN

SCOTT BAGBY
Modern Comprehensive City and Area
Planning and Development
"Plans Which Can Be Carried Out"
14 Mountainside Park Terrace
Upper Montclair, N. J.

BUCK, SEIFERT AND JOST
Consulting Engineers
Water Supply, Sewage Disposal, Hydraulic Developments, Valuations and Reports.
Chemical and Biological Laboratories.
112 East 19th Street — New York 3, N. Y.

MICHAEL BAKER, JR., INC.
The Baker Engineers
Civil Engineers—Planners—Surveyors
Municipal Engineers—Airport Design — Sewage Disposal Systems —
Water Works Design and Operation—
Consulting Service—Surveys and Maps
Branch Office—Jackson, Miss.
Home Office—Rochester, Pa.

Philip Burgess
Chester A. Nipie
Ben K. Bare
Clayton C. Bull
Raymond Fuller
S. F. Hatch
Tahlman Krumm
R. E. Peters

BURGESS & NIPLE
CIVIL AND SANITARY ENGINEERS
CONSULTANTS SINCE 1908
WATER AND SEWAGE PROBLEMS
584 EAST BROAD STREET
COLUMBUS 15, OHIO

Design
Construction
Reports
Planning
Valuations
Rates
Supervision
Laboratory

BARKER & WHEELER
36 State Street — Albany, N. Y.
11 Park Place — New York City 7
Sewage Disposal — Public Utility and
Water Supply — Industrial Valu-
Sewerage — ations and Rates
Power

BURNS & McDONNELL
Consulting and *Designing Engineers*
Kansas City 2, Mo.
P. O. Box 7088
Cleveland 14, Ohio
1404 East 9th St.

E. D. BARSTOW
Sanitary Engineer
Water Supply—Water Treatment
Sewerage—Sewage Treatment
Reports—Plans—Construction
163 N. Union St., Akron 4, Ohio

THE HARWOOD BEEBE CO.
Municipal and Civil Engineers
Water Supply and Purification, Sewerage and Sewage Treatment, Streets, Light & Power, Airports
171 Pine St.
Spartanburg, S. C.

CHURCHILL-FULMER ASSOCIATES
CITY PLANNING
19 W. 44th St., New York 18, N. Y.

L. COFF
Consulting Engineer
198 Broadway, New York 7, N. Y.
PRESTRESSED CONCRETE STRUCTURES
Design, Estimates, Construction Methods, Supervision

CHAS. W. COLE & SON
Engineers—Architects
Municipal
Industrial
Commercial
220 W. LaSalle St. So Bend, Ind.
Phone 4-0127

HOWARD K. BELL
Consulting Engineers
G. S. Bell C. G. Gaither J. K. Latham
Water Works — Sewage Disposal
Water Purification — Sewerage
Street — Refuse Disposal
Industrial Wastes
553 S. Limestone St. Lexington, Ky.

THE J. M. CLEMINSHAW COMPANY
"Our 29th Year"
APPRAISALS—REVALUATIONS
Specializing in the revaluation of Real Estate and Personal Property for local tax equalization purposes. Illustrated brochure on request.
Union Commerce Bldg. CLEVELAND — *Public Appraisal Service is a Public Trust* — McGraw Hill Bldg. NEW YORK

CLINTON L. BOGERT ASSOCIATES
Consulting Engineers
Clinton L. Bogert — Ivan L. Bogert
Water and Sewage Works
Refuse Disposal — Industrial Wastes
Drainage — Flood Control
684 Madison Ave., New York 22, N. Y.

COLE • LAYER • TRUMBLE COMPANY
REVALUATIONS
CLT
APPRAISALS
Municipal and County Tax Revaluations
11 W Monument Ave • Dayton 2, Ohio
Descriptive Material upon Request

The Consulting Engineers' section of THE MUNICIPAL INDEX for 1951 will be found on pages 789 to 808

COTTON, PIERCE, STREANDER, INC.
Associated Consulting Engineers
EXECUTIVE OFFICE—683 Atlantic Ave., Boston 11, Mass.
NEW YORK OFFICE—132 Nassau St., New York, N. Y.
OFFICES—PHILADELPHIA, WASHINGTON & GOWANDA, NEW YORK
Civil, Sanitary, Structural, Mechanical, Electrical Engineering Reports, Studies, Design, Supervision. Water Supply, Sewage Treatment, Water Conditioning, Power Plants, City Planning, Industrial Plants.

LOUIS P. BOOZ
Consulting Engineers
Incineration
Sanitation
Water Treatment
Industrial Wastes
51 E. 42 St., New York 18, N. Y.

CONSOER, TOWNSEND & ASSOCIATES
Water Supply—Sewerage—Flood Control & Drainage—
Bridges — Express Highways — Paving — Power Plants,
Appraisals — Reports — Traffic Studies — Airports
351 EAST OHIO STREET — CHICAGO 11, ILL.

Bowe, Albertson & Associates
Engineers
Water and Sewage Works
Industrial Wastes—Refuse Disposal—Municipal Projects
Airfields—Industrial Buildings
Reports—Designs—Estimates
Valuations—Laboratory Service
110 William St. New York 7, N. Y.

DAMON & FOSTER
Consulting Civil Engineers and Surveyors
Water Supply, Sewerage, Sewage Disposal, Surveys, Land Subdivision, City and Town Planning, Reports, Design, Supervision.
Sharon Hill — Pennsylvania

ARE YOU A CITY OFFICIAL?
You will find this Directory a reliable "WHO'S WHO" of consulting engineers who specialize in municipal work.

DE LEUW, CATHER & COMPANY
Consulting Engineers
Public Transit, Traffic and Parking Problems
Railroads — Subways — Grade Separations — Tunnels
Major Thoroughfares — Power Plants — Expressways — Municipal Works
150 North Wacker Drive, Chicago 6, Ill. — 79 McAllister Street, San Francisco 2, Calif.

CAMP, DRESSER & McKEE
Consulting Engineers
Water Works, Water Treatment, Sewerage, Sewage Treatment, Municipal, Industrial Wastes, Investigations, Reports, Design Supervision, Research, Development, Flood Control.
6 Beacon Street Boston 8, Mass.

WALTER DETRICK
Marine Diver
Construction • Repair • Salvage
1425 N. FOURTEENTH — Phone: 5444-J — QUINCY, ILL.

Capitol Engineering Corp.
Engineers—Constructors—Management
Water Works, Sewage Disposal, Airports, Dams and Bridges, Roads and Streets, Planning, Design and Surveys.
Dillsburg — Pennsylvania

CHAS. F. DINGMAN ENGINEER
PALMER, MASS.
Consultant on Construction Cost. Valuation of Physical Assets. Estimates of Cost of Projected Construction or Expansion.
Established 1925

THE CHESTER ENGINEERS
Water Supply and Purification
Sewage and Industrial Waste Treatment—Power Plants—Incineration—Gas Systems
Valuations—Rates—Management
Laboratory—City Planning
210 E. Park Way, Pittsburgh 12, Penna.

CONSULTING ENGINEERS
not already represented in this directory can secure rates for these cards and further particulars of our service by writing to—
Advertising Department
THE AMERICAN CITY
470 FOURTH AVENUE — NEW YORK 16, N. Y.

DESMOND & YARWOOD
Incorporated
Land Architects and Site Planners
Towns, Subdivisions, Housing Projects
School Grounds, Recreation Areas
1 Drake Hill Road — Simsbury, Conn.

Fay, Spofford & Thorndike
Engineers
Airports—Bridges—Buildings
Port Developments—Drainage
Water Supply—Sewerage
Fire Protection
BOSTON — NEW YORK

EMERY C. FURRER
City Planning, Municipal and Sanitary Engineering, Building Codes and Zoning Ordinances, Airports, Drainage, Flood Control, Industrial Plants, Design of Fixed and Movable Bridges.
64 W. Randolph St. — Chicago 1, Ill.

GLACE AND GLACE
Consulting Sanitary Engineers
Sewerage, Sewage and Industrial Wastes Treatment
Design, Construction and Supervision of Operation
Laboratory Service
Front at Boas St., Harrisburg, Pa.

DICKINSON & WHITE
ENGINEERS—SINCE 1909
Design and Supervision of Municipal Improvements — Water Supply & Purification — Sewerage and Sewage Disposal — Reinforced Concrete and Structures — Reports, Valuation and Appraisals
118 N. Spring St., Little Rock, Ark.

Finkbeiner, Pettis & Strout
Carleton S. Finkbeiner — C. E. Pettis
Harold K. Strout
Consulting Engineers
Reports Designs Supervision
Water Supply, Water Treatment, Sewerage, Sewage Treatment, Waste Treatment, Valuations & Appraisals.
318 Jefferson Avenue — Toledo 4, Ohio

GEORGE A. GIESEKE
Consulting Engineers
Municipal Engineering Problems
Surveying, Housing Development
Water Supply, Industrial Wastes
Sewerage, Refuse Incineration
Design
Supervision of Construction
1405 W. Erie Ave. — Phila. 40, Pa.

WILLIAM A. GOFF, Inc.
General Engineering and Consulting Services
Water, Sewerage, Refuse Incineration
Industrial Buildings, Power Plants
Airport Town Planning
Plans, Supervision, Valuations, Reports
304 Keystone Bldg., Pitts. 7, Pa.

ECKENFELDER ASSOCIATES, INC.
Sanitary Chemists
Sewage and Industrial Waste Surveys, Process
Research and Development, Water Analysis, Stream Pollution
Investigations, Laboratory Analyses and Reports
45 N. Broad Street — Ridgewood, N. J.

GREELEY & HANSEN
Engineers
Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal
220 S. State Street, Chicago 4

EDWARDS, KELCEY AND BECK
Consulting Engineers
Surveys — Reports — Economic Studies — Transportation, Traffic and Parking Studies — Design — Supervision — Management — Port and Harbor Works — Terminals — Expressways — Highways — Grade Separations — Bridges — Tunnels — Water Supply
3 William Street, Newark 2, New Jersey — 250 Park Avenue, New York 17, N. Y.

YOUR CARD
could be set in this space at reasonable cost
If you are interested, write
THE AMERICAN CITY
470 Fourth Ave., New York 16,
or 1719 Daily News Building
Chicago 6, Ill.

ELECTRICAL TESTING LABORATORIES, INC.
Electrical and General Testing—Inspections—Research—Certification
2 EAST END AVENUE AT 79th STREET, NEW YORK 21, N. Y.
BUtterfield 8-2600

THE HALLER TESTING LABORATORIES, INC.
Consulting-Testing-Inspection
801 Second Ave., New York, N. Y.
184 Cummington St., Boston, Mass.
336 Leland Ave., Plainfield, N. J.

FAIRCHILD AERIAL SURVEYS, INC.
Photogrammetric Engineers
Topographical Maps, Cadastral Maps, Photographic Mosaics
Aerial Photography in All Phases . . . Nation-wide Service
(26 years' experience supplying city and county map needs)
Western Division — 3384 E. 11th St., Los Angeles 15, Calif.
Eastern Division — 21-21 41st Ave., Long Island City 1, N. Y.

JOHN J. HARTE CO.
Engineers—Architects
Water—Sewer—Gas—Paving
Airports—Electric Distribution
Drainage—Structural—Site Planning
Forsyth Bldg. — Atlanta, Ga.

Established 1913
WALTER H. FLOOD & CO.
CHEMICAL ENGINEERS
INSPECTION AND TESTING OF MATERIALS AND STRUCTURES
STREETS — ROADS — AIRPORTS
BUILDING AND GENERAL ENGINEERING CONSTRUCTION
Resident Inspection—Chemical & Physical Tests—Soil Boring & Investigation—Concrete Core Cutting
SPECIFICATIONS — REPORTS — RESEARCH
6102 SO. BLACKSTONE AVENUE — CHICAGO 37, ILL.

CHARLES A. HASKINS
Consulting Engineers
Sewerage, Water Supply, Hydraulics, Power, Paving, Valuations, Investigations, Reports.
1000 Baltimore Ave.
Kansas City 6, Missouri

Ford, Bacon & Davis
Construction — *Reports* — **Engineers** — *Valuations* — *Airports*
New York • Philadelphia • Chicago • Los Angeles

HAVENS AND EMERSON
W. L. Havens — C. A. Emerson
A. A. Burger — F. C. Tolles — F. W. Jones
Consulting Engineers
Water, Sewerage, Garbage, Industrial Wastes, Valuations—Laboratories
Leader Bldg. — Cleveland 14
Woolworth Bldg. — New York 7

GANNETT FLEMING CORDDRY AND CARPENTER, INC.
Pittsburgh, Pa. — Daytona Beach, Fla.
ENGINEERS
HARRISBURG, PA.
Scranton, Pa. — Medellin, Col., S. A.
Water Works, Sewage, Industrial Wastes and Garbage Disposal—Roads, Airports, Bridges and Flood Control, Town Planning, Appraisals, Investigations and Reports.

CHARLES HAYDOCK
Consulting Engineers
Water Works and Sanitation, Industrial Wastes
Design, Construction, Operation and Management Reports and Valuations
2314 Girard Trust Company Bldg., Philadelphia 2, Pa.

ARE YOU A CITY OFFICIAL?
You will find this Directory a reliable "WHO'S WHO" of consulting engineers who specialize in municipal work.

RICHARD HAZEN
CONSULTING ENGINEER
Municipal and Industrial Water Supply and Treatment
Sewage and Waste Disposal
Reports, Design, Construction, Operations
110 E. 42nd St. — New York 17, N. Y.

HENNINGSON, DURHAM & RICHARDSON
Consulting Engineers since 1917 for more than 700 cities and towns.
Water Works, Light and Power, Sewers, Sewage Treatment, Reports, Flood Control, Appraisals, Drainage, Rural Electrification.
Standard Oil Bldg. Omaha 2, Nebraska

KEIS & HOLROYD
Consulting Engineers
Formerly Solomon & Keis
Since 1906
Water Supply and Purification, Sewerage and Sewage Treatment, Garbage and Refuse Disposal and Incineration, Industrial Buildings
Troy, N. Y. Ft. Lauderdale, Fla.

A. C. KIRKWOOD AND ASSOCIATES
Engineers — Consultants
Wirthman Bldg.
Kansas City 3, Mo.

MORRIS KNOWLES, Inc.
Engineers
Water Supply and Purification, Sewerage and Sewage Disposal Valuations, Laboratory, City Planning.
1312 Park Bldg.
Pittsburgh 22, Pa.

HILL and HILL
Engineers
Sewage and Waste Disposal. Water Supply and Filtration. Dams. Reservoirs. Tunnels. Airport and Topographic Surveys
Home Office: 8 Gibson Street North East, Pa.

KINCAID & HUTCHINSON
Planners and Architects
Consultation in city and regional planning; Zoning and building regulations; Subdivision design; Site planning for apartments, shopping centers and redevelopment areas; and general architectural practice.
185 W. Madison St. Chicago 2, Ill.

Knappen, Tippetts, Abbett Engineering Co.
Ports, Harbors, Flood Control, Irrigation, Power, Dams, Bridges, Tunnels, Highways, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.
62 West 47th St., New York City

LOUIS J. KROEGER AND ASSOCIATES
Administrative Surveys—Personnel Classification—Salary Plans—Civil Service Testing
1005 Humboldt Bank Bldg.
San Francisco
597 James Oviat Bldg.
Los Angeles

Hitchcock & Estabrook, Inc.
Lester D. Lee, Associate
Professional Engineers and Architects
Consultants to Municipalities Since 1920
300 Lincoln Bldg. Minneapolis 1, Minn.

GRIFFENHAGEN & ASSOCIATES
Consultants in Public Administration and Finance
Counsel and technical assistance on organization, procedure, personnel, physical facilities, finance, policies, and plans.
Washington Milwaukee Boston Los Angeles Chicago New York

HORNER & SHIFRIN
Consulting Engineer
W. W. Horner H. Shifrin
V. C. Lischer E. E. Bloo
Airports—Hydraulic Engineering Sewerage—Sewage Treatment
Water Supply — Municipal Engineering—Reports.
Shell Building, St. Louis 3, Mo.

L. B. GRIFFITH
Consulting Engineer
Research, Reports and Designs on Sewage and Industrial Waste Treatment.
321 N. Thomas St. Arlington, Va.
918 F St. N. W., Washington 1, D. C.

ROBERT W. HUNT CO.
Engineers
Inspection—Tests—Consultation Pipe and Appurtenances: Paving and Engineering Materials: Green and Treated Lumber
175 W. Jackson Blvd., Chicago 4 and all large industrial centers.

ROBERT BRUCE HARRIS
Landscape & Golf Course Architect
GOLF COURSES • PARKS • SCHOOL GROUNDS • INSTITUTIONS • SITE PLANNING
664 N. MICHIGAN AVENUE · CHICAGO 11 · ILLINOIS

H. R. HUNTER
Consulting Engineers
Water supply and treatment, Sewerage and disposal, Streets, Drainage, Power Plants, Gas systems, Airports, Appraisals and Reports.
313 East Third Street, Wichita, Kans.

THE GEORGE B. HORAN COMPANY
Appraisal Engineers
Municipal Tax Revaluations and Aerial Surveys
New Haven 10, Conn. "Covering New England"

Jenkins, Merchant & Nankivil
Consulting Engineers
Municipal Improvements Sewerage
Power Development Water Systems
Traffic Surveys Industrial Plants
Flood Control Recreational Facilities
Airports Investigations and Reports
805 East Miller St. Springfield, Ill.

CHAUNCEY A. HYATT
Consultant Specialist on Swimming Pools Exclusively
Design — Operation — Maintenance — Renovation of existing pools.
Plans checked — Reports — Surveys.
"35 Years of Experience Covering Thousands of Pools" 5555 Sheridan Rd., Chicago 40, Ill.

The Jennings-Lawrence Co.
Civil & Municipal Engineers
C. C. Walker F. L. Swickard
R. I. Sheridan R. L. Lawrence
Water Supply—Treatment—Distribution
Sewerage—Sewage Treatment—Paving
Drainage—Dams Surveys—Mapping
Reports Plans—Supervision
12 N. Third St. Columbus 15, Ohio

CONSULTING ENGINEERS
not already represented in this directory can secure rates for these cards and further particulars of our service by writing to—
Advertising Department
THE AMERICAN CITY
470 FOURTH AVENUE NEW YORK 16, N. Y.

JONES, HENRY & SCHOONMAKER
(Formerly Jones & Henry)
Consulting Sanitary Engineers
Water Works
Sewerage & Treatment
Waste Disposal
Security Bldg. Toledo 4, Ohio

J. L. JACOBS & COMPANY
Management Consultants and Engineers
Surveys — Reports — Installations
Organization — Procedure — Budgetary Control — Property Valuation and Equalization
Job Evaluation — Classification — Salary Administration
53 WEST JACKSON BLVD. CHICAGO 4, ILL.

KAISER ENGINEERS
Division of Kaiser Industries, Inc.
General Engineering Services
Public Works
1924 Broadway, Oakland 12, Cal.
Phone: Twin Oaks 3-4800

ENGINEERING OFFICE OF CLYDE C. KENNEDY
COMPLETE MUNICIPAL ENGINEERING SERVICE
For More Than a Quarter Century
Investigation, Reports, Design, Supervision of Construction and Operation.
WATER SUPPLY, WATER CONDITIONING, SEWERAGE, SEWAGE AND WASTE TREATMENT
604 Mission Street CHEMICAL AND BIOLOGICAL LABORATORY San Francisco 5

The American City Professional Service Directory

HAROLD M. LEWIS
Consulting Engineer, City Planner Municipal & Regional Planning
Analyses of urban problems, zoning, master plans, traffic, parking, subdivisions, redevelopment.
Reports—Plans—Ordinances
15 Park Row New York 38, N. Y.

THE JOHN McCRADY CO.
Civil and Municipal Engineers
Charleston, S. C.

McHUGH and McCROSKY
Consultants
Community and Regional Development Problems. Plans and Programs. Zoning. Subdivision Regulations. Traffic. Capital Budgets. Planning Administration. Urban Redevelopment. Investigations and Reports.
23 East 26th St. New York 10, N. Y.

LEONARD MISCALL AND ASSOCIATES
Consultants
Municipal Problems, Planning and Zoning Studies and Reports
111 Parker Pl. Ithaca, New York

WM. S. LOZIER CO.
Consulting Engineers
Sewerage, Sewage Disposal, Water Supply, Water Purification, Refuse Disposal
10 Gibbs St., Rochester 4, N. Y.

JOHN B. McGAUGHY ASSOCIATES
Consulting Engineers
Water supply, sewage disposal, airports, streets, improvements, municipal planning, buildings, recreational facilities, reports and appraisals.
700 Front Street Norfolk 7, Va.

GEORGE B. MEBUS
Consulting Engineer
Water Supply Sewage Treatment
Industrial Waste Treatment
Northwestern Natl. Bank Bldg., Glenside, Pa.

CHANGED YOUR ADDRESS?
If so, please notify the publishers as we are anxious to have your card correct in this Directory. Thank you.

ARTHUR LAZARUS COMPANY
Management Consultants
Organization and Procedural Studies of Large Municipal and State Departments
70 PINE STREET NEW YORK 5, N. Y.

Municipal-Industrial Development & Engineering Associates
Consulting Engineers
Modern Power Plants • Central Heating Street Lighting • Water Works and Treating Plants • Sewage and Waste Disposal • Put your town out in front with our advanced Utility Engineering and Design.
1006 South 31st Ave., Chicago 50, Ill.

METCALF & EDDY
Engineers
Water, Sewage, Drainage, Refuse and Industrial Wastes Problems
Air Fields, Laboratory, Valuations
Statler Building, Boston 16, Mass.

B. L. Oliver & Company
Municipal Consulting Engineers
Water Systems, Electric Plants, Distribution, Disposal Plants, Sewerage, Paving and Drainage, Gas Systems, Utility Reports, Rates and Appraisals.
Grand Avenue Bank Bldg., Kansas City 6, Missouri

JOHN M. MUDDEMAN & ASSOCIATES
Planning Consultants
STONY BROOK AND SEAFORD, LONG ISLAND, N. Y.
Comprehensive Municipal Planning Programs—Subdivisions—Zoning—Traffic—Master Plans—Airports—Building Codes and General Consulting Service
Tax Maps and Revaluation Surveys—Complete Reports for Capital Budgets and Municipal Finance.

PATZIG TESTING LABORATORIES
Inspection Service
Chemical and Physical Testing of Paving and Building Materials, Metals, Fuels, Oils, Water, etc.
2215 Ingersoll Av., Des Moines, Ia.

HENRY DAVIS NADIG
Public Relations Counsel
Municipal • Planning • Engineering • Association
341 Madison Ave., New York 17, N. Y.

BOYD E. PHELPS, INC.
Architects and Engineers
Water Supply and Purification
Sewerage and Sewage Treatment
Power Plants, Buildings, Investigations Reports, Appraisals, Rate Studies
322 Franklin St., Michigan City, Ind.

NUSSBAUMER - CLARKE and VELZY, INC.
CONSULTING ENGINEERS
SEWAGE TREATMENT — WATER SUPPLY — INCINERATION
DRAINAGE — TOWN PLANNING — APPRAISALS
327 Franklin St., Buffalo 2, N. Y. 52 Vanderbilt Ave., New York 17, N. Y.

Malcolm Pirnie Engineers
Civil and Sanitary Engineers
Malcolm Pirnie Ernest W. Whitlock
G. G. Werner, Jr.
Investigations, Reports, Plans
Supervision of Construction and Operations
Appraisals and Rates
25 West 43rd St., New York 18, N. Y.

THE H. C. NUTTING COMPANY
Inspecting and Testing Engineers
Water Waste Survey Trunk Main Surveys Water Distribution Studies
Chemical and Physical Testing of Paving and Building Materials—Metals—Pipe—Oils, Etc.
4120 Airport Road Cincinnati 26, Ohio

Publicity Public Relations
Editorial Services
Special Publications Speeches
Confidential Assignments
Est. 1927 Realistic Rates
SYLVESTER POINTKOWSKI
63 Park Row, New York 7, N. Y.
Suite 404 CO 7-2915, BE 3-5831

PALMER & BAKER, INC.
Consulting Engineers — Architects
Problems of Transportation, Subaqueous Vehicular Tunnels, Rock Tunnels, Utility Tunnels, Bridges, Grade Separations, Highways, Airports, Traffic Studies, Parking Problems, Waterfront and Harbor Structures. Complete Material, Chemical and Soils Laboratories.
MOBILE, ALABAMA HOUSTON, TEXAS

POLK, POWELL & HENDON
Engineers—Consultants
A. G. Polk Harry H. Hendon
Hugh A. Powell
Water systems, sewers, sewage treatment plants, steam and hydro plants, dams, drainage, industrial, buildings, municipal planning reports, plans, estimates, supervision.
620 C. of C. Bldg. Birmingham 3, Ala.

ALEXANDER POTTER ASSOCIATES
Consulting Engineers
Water Works, Sewerage, Industrial Wastes, Hydraulic Works, Reports, Designs, Appraisals
30 Church Street, New York 7, N. Y.

HENRY B. STEEG & ASSOCIATES
Engineers
Sewage Treatment Water Supply
Refuse Disposal Flood Control
City Planning Traffic Studies
2331 North Meridian Street
Indianapolis 8, Ind.

D. B. STEINMAN
Consulting Engineer
Bridges
Design, Construction
Strengthening, Investigations, Reports, Advisory Service
117 Liberty Street, New York 6

OFFICE of A. CARL STELLING
Consulting Landscape Architects and Site Planners
Communities, Subdivisions, Housing Projects, Parks and Recreation Areas, Schools and Universities, etc.
127 East 39th St., New York 16, N. Y.

SCOFIELD ENGINEERING CO.
Philadelphia
Consulting Engineers
Municipal Improvements
Water, Gas and Electric Plants
Valuations and Appraisals

PARSONS, BRINCKERHOFF, HALL & MACDONALD
Engineers
Airports, Bridges, Tunnels, Highways, Traffic & Transportation Reports, Subways, Foundations, Harbor Works, Valuations, Industrial Buildings, Power Developments, Dams, Sewerage, Water Supply.
51 Broadway, New York 6, N. Y.

Ladislas Segoe & Associates
City Planners—Consulting Engineers
Comprehensive City Plans ● Zoning Plans, Ordinances and Expert Testimony ● Traffic, Transit, Transportation Studies ● Housing Surveys ● Urban Redevelopment & Housing.
517 Provident Bank Bldg., Cincinnati 2, O.

PFEIFER AND SHULTZ
Engineers
Power Plants — Industrial Buildings
Water Supply — Sewage Disposal
Wesley Temple Building — Minneapolis 3, Minn.

I. S. SHATTUCK
City Plans—Land Use, Zoning, Industrial, Residential and other Urban Development, Subdivision Design.
Traffic and Parking Plans.
P. O. Box 312 — Wayzata, Minn.

THE PITOMETER COMPANY, INC.
Engineers
Water Waste Surveys — Trunk Main Surveys — Water Distribution Studies
Water Measurement and Special Hydraulic Investigations
50 Church Street — New York 7, N. Y.

LAWRENCE V. SHERIDAN
Planning Consultant
City and County Planning—Zoning—Recreational Development—Neighborhood Development—Long-range Public Works Programs—Landscape Architecture.
Broadwood, Indianapolis 44, Ind.

PITTSBURGH TESTING LABORATORY
INSPECTING ENGINEERS AND CHEMISTS
PITTSBURGH, PA.
Branch Offices in Principal Cities

GEORGE W. SIMONS, JR. AND ASSOCIATES
Planning Consultants and Municipal Engineers
City, County Plans—Zoning—Redevelopment and Housing—Traffic and Parking Studies — Parks — Recreation — Subdivisions—Landscaping
402 Hildebrandt Bldg., Jacksonville 2, Florida

ALBERT PLEYDELL ASSOCIATES, INCORPORATED
Consultants in Administrative Management: Government—Non-Profit Agencies—Business
ADMINISTRATIVE AND TECHNICAL STUDIES FOR GOVERNMENT
Departmental Organization, Functions and Over-All Operations—
Budgeting—Office Procedures and Mechanization—Reclassification—
Purchasing—Inventory Control—Storekeeping
280 Lafayette Street — New York 12, N. Y.

SINGSTAD & BAILLIE
Consulting Engineers
Ole Singstad — David G. Baillie, Jr.
Tunnels, Subways, Highways, Foundations, Parking Garages
Investigations, Reports, Design Specifications, Supervision.
34 State St. — New York 4, N. Y.

CLYDE POTTS ASSOCIATES
Weston Gavett — Stanley N. Williams
Sewerage and Sewage Disposal — Water Works and Water Supply
Valuations and Appraisals
50 CHURCH STREET — NEW YORK 7, N. Y.

J. E. SIRRINE COMPANY
Engineers
Water Supply & Purification
Sewage & Industrial Waste Disposal, Stream Pollution Reports,
Utilities, Analyses
Greenville — South Carolina

PRODUCTIONS, Incorporated
Creators and executors of properly planned community publicity and public relations
Publications — Special Assignments —Campaigns — Reports
Municipal — Associations — Organization
Public Relations Counsel to Municipalities — Associations — Organizations
50 Broad Street — Charleston, South Carolina

SMITH and GILLESPIE
Consulting Engineers
All types of Municipal Public Works & Utilities
Complete Services
P.O. Box 1048, Jacksonville, Fla.

ROBERT AND COMPANY ASSOCIATES
Architects and Engineers
Water Supply — Incinerators
Sewage Disposal — Power Plants
Industrial Wastes — Valuations
ATLANTA, GEORGIA

SMITH, DIBBLE & CO.
Transportation and Planning Engineers
Traffic improvement plans — parking studies—transit studies — zoning plans — major street plans.
1420 Lady St., Columbia, S. Car.

RUSSELL & AXON
Consulting Engineers
Water Works, Sewerage, Sewage Disposal, Power Plants, Appraisals.
406 Olive St. — Municipal Airport
St. Louis 2, Mo. — Daytona Beach, Fla.

STANLEY ENGINEERING CO.
Consulting Engineers
Airports—Drainage—Electric Power
Flood Control—Rate Studies
Sewerage—Valuations—Water Works
Hershey Bldg. Muscatine, Iowa

HENRY W. TAYLOR
Water Supply, Sewerage
Garbage Disposal, Incineration
Industrial Wastes Disposal
Hydraulic Developments
11 Park Place, New York 7, N. Y.

S. W. A. ASSOCIATES
Structural and Hydraulic Engineers
Designs Reports Investigations
Buildings, Power Plants, Airports
Docks, Highways, Water Supply &
Sewage Treatment Works, Analysis of
New Developments
Wall Church Road Belmar, N. J.

TOWN PLANNING
IN ALL ITS PHASES
TECHNICAL PLANNING ASSOCIATES, Inc.
New Haven 10 Conn.

SEELYE STEVENSON VALUE & KNECHT
Consulting Engineers
Airports, Highways, Dams, Concrete, Steel, Welding, Foundations, Stadia, Appraisals and Industrial Plants
101 Park Avenue New York 17, N. Y.

PAUL A. UHLMANN & ASSOCIATES
Paul A. Uhlmann H. E. Bonham
Carl E. Kuck Rye Grant
Consulting Engineers
Sewage and Industrial Waste Treatment
Water Supply and Purification
1441 N. High St. Columbus 1, O.

SNYDER, McLELLAN, RHOADS AND WATSON
Financial and Engineering Counsellors
Studies-Reports Public Relations
Bond Promotion Surveys
Design Engineering
WATER SEWERAGE
Hillsboro, Indiana

J. STEPHEN WATKINS
J. S. WATKINS G. B. WATKINS
Consulting Engineers
Municipal and Industrial Engineering, Water Supply and Purification, Sewerage and Sewage Treatment, Lighting Plants and Distribution, Reports, Investigations and Rate Structures.
251 E. High St. Lexington 4, Ky.

CONSULTING ENGINEERS
not already represented in this directory can secure rates for these cards and further particulars of our service by writing to—
Advertising Department
THE AMERICAN CITY
470 FOURTH AVENUE NEW YORK 16, N. Y.

WILLIAM J. WENZEL
Consulting Engineer
Developing the Great Northwest
Great Falls Montana

ROBERT H. STELLWAGEN
Consulting Engineer
Municipal and Industrial Waste Problems
Collection, Incineration, Salvage, Pumping, Treatment, Testing
629 Buhl Bldg. Detroit 26, Mich.

WESTON & SAMPSON
Consulting Engineers
Hydraulic and Public Health Engineering—Engineering and Laboratory Investigations.
Supervision of Purification Plants
14 Beacon St. Boston, Mass.

ALDEN E. STILSON & ASSOCIATES, LIMITED
Consulting Engineers
Water — Sewerage — Waste — Mechanical — Structural
Surveys — Reports — Appraisals
209 SOUTH HIGH STREET COLUMBUS, OHIO

WHITMAN & HOWARD, Inc.
Engineers — Consultants
Municipal Planning, Water Supply, Drainage, Sewerage, Industrial and Municipal Waste Treatment
89 Broad St. Boston, Mass.

PHILIP B. STREANDER AND AFFILIATES
Consulting Sanitary Engineers
Water Supply, Treatment, Distribution, Sewer Systems, Sewage Treatments, Plans, Supervision, Reports.
132 Nassau Street, New York 7, N. Y.
683 Atlantic Ave., Boston 11, Mass.

WHITMAN, REQUARDT and Associates
Engineers — Consultants
Civil—Sanitary—Structural
Mechanical Electrical
Reports, Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

TOLEDO TESTING LABORATORY
Inspection and Testing of Paving and Engineering Materials
Sub-Surface Exporation and Soil Tests
1810 North 12th Street Toledo 2, Ohio

WIEDEMAN & SINGLETON
Consulting Engineers
Water Works, Sewers, Sewage Disposal
Appraisals, Valuations, Reports
Candler Bldg. Atlanta, Ga.

Your City's Industrial Prospects
Expertly Analyzed
Inexpensive 3-day surveys with recommendations; followed, if desired, by aid in appraising, preparing or organizing a complete industrial development program.
S. B. TOPF, *Industrial Engineer*
116-36 224th Street Cambria Heights 11, N. Y.

WILEY & WILSON
Consulting Engineers
Municipal Planning, Water Supply Sewerage, Sewage and Waste Treatment, Incinerators, Streets and Pavements, Airports, Light and Power Plants. Reports—Plans—Supervision.
915 Peoples Bank Bldg., Lynchburg, Va.
317 American Bldg., Richmond, Va.

UNITED STATES TESTING COMPANY, INC.
1415 PARK AVENUE HOBOKEN, NEW JERSEY
CONSULTING - INSPECTION - TESTING - RESEARCH
ENGINEERS & CHEMISTS
Branches: Boston - Chicago - Los Angeles - New York - Philadelphia - Woonsocket

CHANGED YOUR ADDRESS?
If so, please notify the publishers so we are anxious to have your card correct in this Directory. Thank you.

The American City

The Manufacturers Listed Below

whose advertising you will find in this issue of THE AMERICAN CITY, will be glad to hear from you at any time and to cooperate with you in every way possible in maintaining the efficiency of your municipal activities and to assist you with products and services which will be helpful in developing your municipal improvements.

Abrams Aerial Survey Corp. 199
Adams Mfg. Co., J. D. 20
Adams & Westlake Co. 162
Aeroil Products Co., Inc. 192
Allis-Chalmers Tractor Div. 22
American Appraisal Co. 199
American Grease Stick Co. 178
American-LaFrance-Foamite Corp. ... 61
American Pipe & Construction Co. .. 68
American Playground Device Co. 169
American Tel. & Tel. Co. 4
Anthracite Equipment Corp. 74
Austin-Western Co. 75
Automatic Voting Machine Corp. 40

B & B Engineering Corp. 199
Bead Chain Mfg. Co. 187
Black & Veatch 199
Blackinton & Co., Inc., V. H. 34
Braxmar Co., Inc., C. G. 189
Briegel & Associates, D. L. 199
Buck, Seifert & Jost 199
Buffalo Meter Co. 80
Builders-Providence, Inc. 156
Burgess & Nipple 199
Burns & McDonnell 199
Burroughs Adding Machine Co. 70
Byron Jackson Co. 157

Caisson Wells, Inc. 177
Cast Iron Pipe Research Assn. ... 78, 79
Cast Iron Soil Pipe Institute 52
Cataphote Corporation 185
Caterpillar Tractor Co. 8
Cayuga Rock Salt Co., Inc. 136
Champion Corporation 38
Chapman Valve Mfg. Co. 41
Chicago Bridge and Iron Co. 10
Cleminshaw Co., J. M. 200
Clow & Sons, James B. 39, 54, 197
Cole-Layer-Trumble Co. 200
Cole Mfg. Co., R. D. 36
Collins & Co., Thomas F. 173
Connelly, Inc. 186
Connery Construction Co. 36
Consoer, Townsend & Assoc. 200
Consulting Engineers 199-205
Conveyor Company 39
Cotton, Pierce, Streander, Inc. 200
Cyclone Fence Div. 31

Dahlman Equipment Sales Co. 178
Damon & Foster 200
De Leuw, Cather Co. 200
Dempster Bros., Inc. 180
Detectron Company 167
Detrick, Walter 200
Detroit Mechanical Hoist Corp. 63
Dietz Co., R. E. 163
Dingman, Charles F. 200
Disston & Sons, Inc., Henry 194
Dixie Tank and Bridge Co. 72
Dorr Company 132
Dresser Mfg. Div. 62
Drott Mfg. Co. 58, 59
Dual Parking Meter Co. 138
Duncan Parking Meter Corp. 164

Eagle Signal Corp. 57
Eastman Kodak Co. 139
Eckenfelder Assoc., Inc. 201
Edwards, Kelcey & Beck 201
Eddy Valve Co. 197
Electrical Testing Laboratories, Inc. 201
Embury Mfg. Co. 167
Expanding Sewer Machine Co. 50

Fairbanks, Morse & Co. 38
Fairchild Aerial Surveys, Inc. 201
Ferro Enameling Co. 186
Fisher Research Laboratory, Inc. 36
Fitzgerald Engineering Co., Inc. 173
Flexible Undergr. Pipe Cleaning Co. 38
Flink Company 195
Flood & Co., Walter H. 201
Ford, Bacon & Davis 201

Four Wheel Drive Auto Co. 71
Fulton Bag & Cotton Mills 163

Gamewell Company 16
Gannett, Fleming, Corddry & Carpenter 201
General Electric Co. 42, 66, 67, 146
Goldak Company 48, 182
Globe Phone Mfg. Corp. 74
Gravely Motor Plow and Cultivator Company 192
Greenlee Tool Co. 175
Griffenhagen & Associates 202
Griffith, L. B. 202
Gunite Concrete & Construction Co. 44

Harley-Davidson Motor Co. 49
Harris, Robert Bruce 202
Heil Company 50
Hellige, Inc. 181
Hersey Mfg. Co. 37
Homelite Corp. 43
Horan Co., George B. 202
H. O. R. Co., Inc. 166
Hotchkiss Steel Products Co. 50
Hubbard & Co. 150
Huber Mfg. Co. 158
Hyatt, Chauncey A. 202

Infilco, Inc. 12
International Harvester Co. ... 47, 58, 59
Interstate Rubber Products Corp. ... 182
Iowa Valve Co. 54

Jacobs Co., J. L. 202
Jaeger Machine Co. 169
Johnson Steel & Wire Co. 190
Joslyn Mfg. and Supply Co. 148

Karpark Corporation 190
Keasbey & Mattison Co. 45
Kennedy Co., Clyde C. 202
Klett Mfg. Co. 40

Layne & Bowler, Inc. 6
Lazarus Co., Arthur 203
Leadite Company 192
Leaf Loader Div., American Structural Steel and Tank Co. 185
Le Roi Company 32, 33
LeTourneau, Inc., R. G. 175
Lincoln Hotel 48
Lindsay Co., P. K. 195
Littleford Bros., Inc. 63
Lock Joint Pipe Co. 73
Lube Jack Co. 178
Lull Mfg. Co. 35

Magee-Hale Park-O-Meter Corp. 142
Mathieson Chemical Corp. 81
Maxim Silencer Co. 60
Metcalf & Eddy 203
Mi-Co Meters 77
Miro-Flex Company 72
Modern Mfg. Co. 190
Muddeman & Assoc., John M. 203

Nadig, Henry Davis 203
National Clay Pipe Mfrs., Inc. 134
National Supply Co., Engine Div. ... 170
Neenah Foundry Co. 74
Neptune Meter Company 82
Nordberg Mfg. Co. 174
Northern Gravel Co. 48
Nussbaumer, Clarke & Velzey, Inc. ... 203
Nutting Co., H. C. 203

Ohio Brass Co. 154
Oliver Corporation 55
Onan & Sons, Inc., D. W. 181
Oshkosh Motor Truck, Inc. 160

Pacific Flush Tank Co. 186
Palmer & Baker, Inc. 203

Parsons, Brinckerhoff, Hall and Macdonald 204
Pathfinder Co. 194
Peerless Pump Div. 193
Permutit Company 46
Pfeiffer & Shultz 204
Pioneers, Inc. 159
Pitometer Company 204
Pittsburgh Coke and Chemical Co. .. 198
Pittsburgh-Des Moines Steel Co. 184
Pittsburgh Testing Laboratory 204
Pleydell Assoc., Inc., Albert 204
Portland Cement Assn. 176
Potts Assoc., Clyde 204
Pressure Concrete Co. 197
Prismo Safety Corp. 140
Productions, Inc. 204

RCA Engineering Products 189
Recordak Corp. 139
Refinite Corp. 168
Revere Electric Mfg. Co. 191
Rhodes, Inc., M. H. 207
Robert & Co. Associates 204
Ross Valve Mfg. Co., Inc. 177
Russell & Axon 204
Ryerson & Co., Inc., Joseph T. 14

Sanitary Engineers 199-205
Schield Bantam Co. 30
Seelye, Stevenson, Value & Knecht .. 205
Sherman Products, Inc. 36
Signal Flare Div., Standard Railway Fusee Corp. 192
Skinner Co., M. B. 53
Smith Mfg. Co., A. P. 26
Snyder, McLellan, Rhoads & Watson . 205
Solvay Sales Div. 64
Sonar Radio Corp. 182
Sparkler Mfg. Co. 60
Stauffer Mfg. Co. 165
Stellwagon, Robert H. 205
Stewart Iron Works Co., Inc. 192
Stilson & Assoc., Ltd., Alden E. 205
Streander & Affiliates, Philip B. 205
Swenson Spreader and Mfg. Co. 44

Tarrant Mfg. Co. 165
Tennessee Corp. 179
Texas Company 2, 24
Timber Structures, Inc. 171
Todd Shipyards Corp. 76
Toledo Testing Laboratory 205
Topf, S. B. 205

Underwood Corp. 186
Union Metal Mfg. Co. 152
Unit Mfg. Co. 44
U. S. Pipe and Foundry Co. 65
U. S. Steel Subsidiary 31
U. S. Testing Co., Inc. 205

Valve & Primer Corp. 44
Vendo Co. 186

Wallace & Tiernan Co., Inc. .. Back Cover
Warren Foundry Co., Inc. 190
Wausau Iron Works Inc. 196
Wayne Mfg. Co. 18
Western Railroad Supply Co. 51
Westinghouse Electric Corp. 144
White Manufacturing Co. 60
White Motor Co. 68
Wilkinson Products Co. 44
Wilshire Power Sweeper Co. 50
Williams Gauge Co. 173
William & Harvey Nurseries 186
Winko-Matic Signal Co. 195
Wood Co., R. D. 183
Woods Mfg. Co., J. E. 197
Worthington-Gamon Meter Div. 40
Worthington Pump and Machy. Corp. Public Works Div. 56
Steam Turbine Div. 172

TROY, N.Y. installs MARK-TIME parking meters

and benefits 4 ways

1 Better traffic control
2 Continuous money making
3 Maintenance cost saving
4 End of meter "chiseling"

Troy joins the scores of other progressive cities that are getting more economical, more trouble-free traffic control with the installation of Mark-Time Manual "Hurricane" Parking Meters. It's the simplicity and ruggedness of the Mark-Time design, combined with the special weather-proof features, that keeps the "Hurricane" functioning continuously in all types of weather. And it's that dependable Mark-Time year-round performance that keeps maintenance costs down and revenue up. Additional revenue is obtained by facing the dial side inward, which eliminates the roving meter "chiselers".

MARK-TIME

M. H. RHODES, INC.
HARTFORD, CONNECTICUT

Manufactured and sold in Canada by Ontario Hughes Owens Co. Ltd., of Ottawa, Ontario

PROVEN PRESCRIPTION

against

ODORS
SLUDGE BULKING
CYANIDE WASTES
FILTER FLIES
HIGH B.O.D.
GREASE
UNSTABLE EFFLUENT
BACTERIA

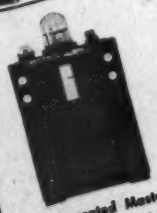
℞ CHLORINATION by WALLACE & TIERNAN

Ingredients:

35 Years' leadership in the art of chlorination.
Able, alert, research and engineering personnel.
Modern, completely equipped manufacturing facilities.
A nation-wide service organization.

Program Controlled Visible Vacuum Chlorinator

Visible Vacuum Chlorinator



Air-operated Master Visible Vacuum Chlorinator

Chlorination for sewage ills is a sure-fire treatment, as the men who know best—the sewage plant superintendents—will tell you.

For example, Mr. Ralph Hoot, Superintendent of Sewage Treatment at Fort Wayne, recently reported: "***We have been most thankful for our automatic chlorine control equipment. It has done its job well."

Such comments from experienced superintendents like Mr. Hoot are typical. Chlorination by Wallace & Tiernan has proven itself by actual use in thousands of installations all over the country. It can help *your* sewage treatment, too, at an initial cost that averages only 1% of total plant investment. This original low cost, coupled with the more effective plant operation that chlorination makes possible, results in a buy that dollar-wise superintendents can't afford to overlook.

Find out ***now*** about this modern aid to sewage treatment, specifically engineered to your individual needs by Wallace & Tiernan. A call to your nearest Wallace & Tiernan Representative will bring you full details.

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

8-54